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TREATMENT OF CANCER OF THE SKIN

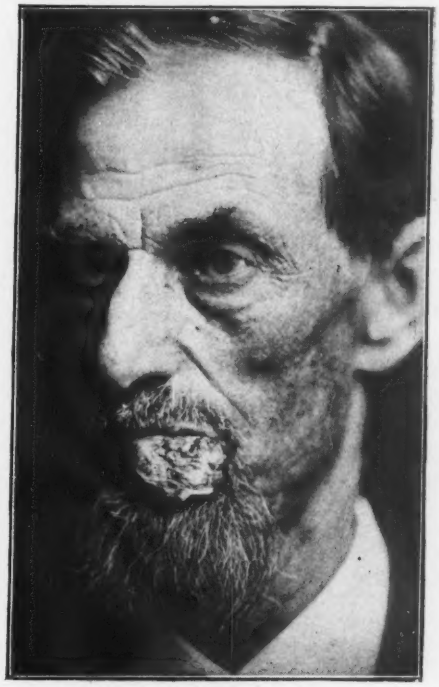
By J. M. KING, B.S., M.D., Nashville, Tenn.

The cancer to which I shall confine my remarks is what is commonly regarded as epithelioma, or cancer of the skin. The cause of such is not yet known. While trauma, burns, irritations of different kinds, may be the exciting cause, and they may start from moles, senile warts, etc., the only observation that can be made is the new and sometimes rapid growth of epithelial tissue, with nearly always resulting ulceration, which fails to heal under simple applications.

This small cancer yields to treatment as a rule when observed early and treated in the proper way, but if untreated, the majority of them will continue to spread, affecting the deeper tissues, producing deeper ulceration, a more loathsome and painful sore, and cachexia follows with death. The individual has suffered the tortures of the damned, and it is sometimes the case that to some extent one of our profession is responsible for it.

So often when a patient observes a suspicious growth, and goes to his physician to ask him what the trouble is, he is met with the remark, "We will wait and see what it does." Often has such been told me by patients when they give their history. By this waiting for development and diagnosis the possibility of a cure is lessened. Or, again, the patient is advised to apply a paste of some kind, which irritates and increases the growth and makes matters worse. Two weeks ago I saw a patient who had been put on mixed treatment. Or, again, the place may be lightly curetted or burned with a cautery and allowed to go, awaiting development.

Or if the physician does not relieve the anxious patient, he will seek the aid of a faith doctor or enter into correspondence with a quack. Our professions is responsible for all this. I am not at all exaggerating; often such is reported by patients, as many of you know. The patient, in the first place, comes to us for relief, but fails to get it. He is put og. He becomes more anxious, because something was not done for him, and he drifts into the open arms of one who is very

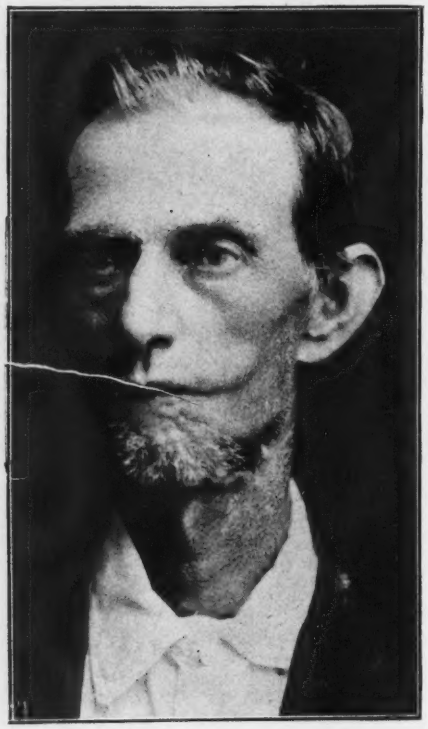


(No. 1)

REMOVED SURGICALLY AND X-RAYED.
(Loaned by W. A. Bryan, M.D.)

anxious to relieve him of both his cancer and his cash.

It seems to me that at this stage of medical progress we should be able to remedy this condition. We should be able nearly always to diagnose the lesion and at once treat it rationally and radically, or have it treated. If the patient should hesitate, such emphasis should be made upon the question that hesi-



(No. 2)

CASE NO. I AFTER TREATMENT.

(Loaned by Dr. Bryan.)

tation becomes nonsense and the patient agrees to treatment. We must be frank with the patient and show him what the sore, or lesion, will ultimately lead to; there is no need of quibbling about the matter. He must face it squarely now or later, and the sooner the better.

My experience in taking the history and treating a number of such cases has led me to believe, as I have expressed myself, and I feel that I should urge every physician to know these things when they come to him and regard them in the most serious light, for there is surely a future to every one passed over lightly.

Since cvancer of the skin is the only variety to be discussed at this time, I shall first give the epithelial structures of the skin from which they may spring.

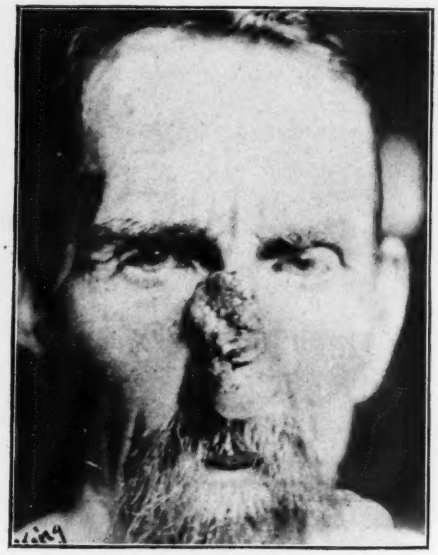
The lower layer of the epidermis itself, the mucous membrane, the hair follicles and the sebaceous glands are the parts from which the growth may start. For some cause the epithelium of these structures takes on a wild and abnormal growth, and the cancer is begun. From whatever part it may start, the growth of epithelium takes on one of two rather definite forms of development, usually defined as the lobular and the tubular. In either case the prolongations of the epithelium push and project themselves through the fibrous tissue of the corium and subcutaneous tissue. In the lobular type the finger-like projections, when cut crosswise and examined with the microscope, show the well-known "cell nests," or "pearls," which are nothing more than concentric layers of epithelium attempting to produce the different layers of the epidermis deep down in the corium, with the horny cells in the center of the lobule. In the tubular type no "pearls" are seen; the structure of the prolongation is homogeneous. Hoewevr, this matters but little, except that the less malignant cancer is of the latter, or tubular, type.

We must bear in mind that from whatever part the growth may start, it spreads as above described, and the object in treatment is to destroy or remove all of this abnormally growing epithelium.

I shall now attempt to describe the clinical appearance of these growths—the very superficial, the more deeply seated, the papillary, and cancer of the lip.

The first thing to consider in the very superficial growth is the development of epithelial cells. This is manifested sometimes by a slight scaly appearance, or by hard, firm feel that is given to the part or small area involved, and there is a slight change of color the color of the spot becoming pearly or waxy in appearance. The color is due to the aggregation of epithelial cells developed between the blood vessels, thus making pressure upon the vessels and cutting out the normal blood supply. This color is not a temporary condition, but accompanies the growth, even during ulceration, along the margin, and is one of the characteristic points of diagnosis.

If the cancer is observed at the beginning of the ulceration, it will present a small, crater-like ulcer, surrounded with an elevated, firm, pearly margin; some discharge, which may be dried into a crust, covering the entire ulcer. The crust is easily removed, leaving a raw, red base, which easily bleeds. In many cases large blood vessels are seen coursing over the

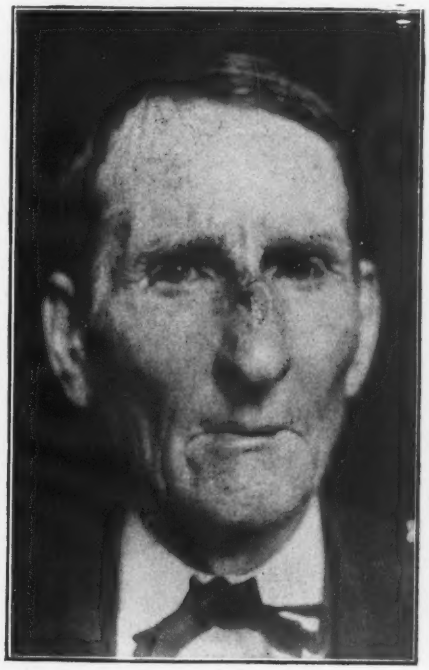


(No. 3)

HAD BEEN TREATED SEVERAL YEARS WITH CAUSTICS AND SALVES. REMOVED WITH CURETT AND X-RAYED.

elevated, rolled margin of the culcer. This appearance is quite characteristic. The cells along the margin continue to grow rapidly, the ulceration follows up closely, and thus it goes on spreading indefinitely.

The chosen site for this variety is about the neck and face, particularly above the mouth and about the nose and eyes, temples and forehead. The growth is not so rapid as that of the other two varieties. It may continue to spread for ten, fifteen or twenty years before producing any serious trouble, and again one may very soon involve the deeper layers of the skin and take on very rapid growth, and death follow quite soon.



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CASE NO. 3 ONE MONTH AFTER TREATMENT. ALMOST HEALED.

It may start from apparently healthy skin, from a burn with a curling iron, from a mole, or from a mole which has been bee stung,

from senile warts, or from trauma such as the prick of a splinter.

There is another type of this superficial variety we should always keep in mind, and that is the discoid, and is most often seen about the

(No. 5)
TREATED AT FIRST BY X-RAYS WITHOUT EXCISION. RECURRED SIX YEARS AFTERWARDS. THEN EXCISED AND X-RAYED.
(Loaned by Dr. Bryan.)

temple and cheek. This is flat and thin and feels firm, like a thin, hardened layer of epithelium inserted into the upper layer of the skin. It is so thin that the circulation is not noticeably impaired, and it may grow to the size of a quarter without ulceration. It is nevertheless malignant.

The deeper variety begins to form its growth deeper down in the corium, and may start from any of the epithelial tissue, but it does not involve the epidermis so much as the superficial variety does, and presents a different appearance at the beginning. The growth is red, hard and nodular, and deeper seated, and in its growth causes the epidermis to bulge on the surface. Finally ulceration takes place with the formation of a deeper ulcer than the more superficial variety. The discharge is more profuse and more bloody, with less crusting. Syphilitic gumma and tubercular adenitis must be considered in the diagnosis.

The papillary variety usually assumes the papillomatous appearance early in its growth. It may start deep in the skin and grow out through the surface with great rapidity. The epidermal covering is lost, the growth is red, weeping, cracked, slightly crusted, and as a whole presents the appearance of a growth like a red raspberry, and some may be pedunculated. Their rapid recurrence after removal with the knife is rather astonishing.

Either of the last two varieties may start from the superficial, or they may start, primarily, as deep seated and papillary cancers.

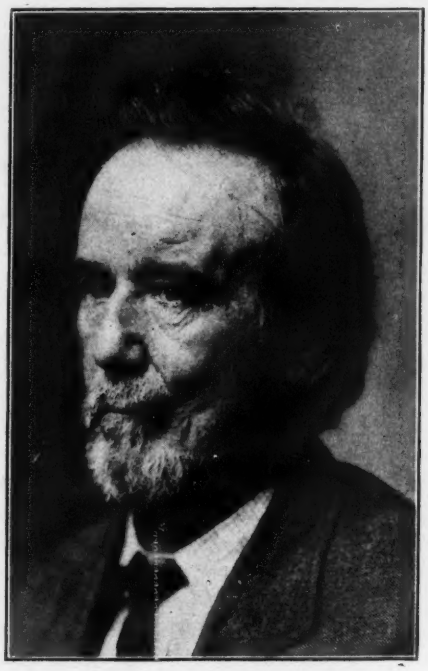
Cancer of the lip as a rule is superficial at first and is more like the first variety discussed, but on account of there being no barrier or subcutaneous tissue—the cutaneous and muscular tissues are so intimately associated that they are practically one and the same—so that the growth of epithelium spreads into the deeper parts with more ease, and it very soon loses its superficial appearance and existence. However, sometimes one may exist on the surface for a few years without involving the deeper parts.

You will observe that I have attempted to lay stress upon the early appearance and diagnosis of these growths, for it is at the very beginning that the most effective work can be done. Every one should be able to diagnose a cancer after it is fully developed.

THE TREATMENT.—The object in treatment is to utterly destroy or remove every vestige of epthelial tissue which has taken on the cancerous growth. Of all the remedies yet devised—excision, pastes, electrolysis, caustics, cautery—the X-rays stand out pre-eminently as the one from which the greater percentage of cures will result. In the other methods the prolongations of epithelium are more liable to be left behind—maybe some of the ends are

cut off, or some of the cells left—then as a matter of course recurrence is unavoidable. But the therapeutic action of the rays is such that by their proper application they can be used over a larger area than would be excised, etc., and to such an extent that he cancer cells may be destroyed. If thre is redundant tissue, such as elevated margins, papillomatous growth, etc., the curette should be used thoroughly and followed with repeated exposures to the rays. If the growth is deep it should be removed with the knife and the open wound exposed to the rays repeatedly. The curetting and excision are to be regarded as secondary and preparatory procedures, and the X-rays as the curative agent which should be energetically applied. One must be careful not to produce too severe X-ray drmatitis, but even after a severe drmatitis the scar is good, for the scar after X-ray in cancer is the best, from a cosmetic standpoint, of all the methods of treatment. Radium gives practically the same scar. The X-rays can be applied to any size cancer on the surface, no matter how small or where it is located, even on the eyelid or margin of the lid.

I have now treated forty or more cases of epitheliomata by the method advised above, and have had but few recurrences, and these were of minor importance and were easily controlled by further application of X-rays, and I believe the recurrence in these cases were due to a failure to at first destroy all of the cells rather than to the new formation of cancer cells. We must ever keep in mind that there is a limit to the curative action of the X-rays, but when the surface is properly prepared and the rays judiciously applied I believe today they constitute our strongest therapeutic agent in the treatment of superficial cancer of the skin.



(No. 6)
CASE NO. 5 AFTER TREATMENT.
(Loaned by Dr. Bryan.)

(No. 7)
HOPELESS CASE. FIRST TREATED BY FAITH DOCTOR, AFTERWARDS WITH CAUSTICS.

INGUINAL HERNIA AND ITS SUCCESSFUL CURE BY OPERATION WITH LOCAL ANAESTHESIA

By W. WHATLEY BATTEY, Jr., M.D.,

Asst. Prof. Anatomy and Clinical Surgery Medical Department, University of Georgia, Augusta, Ga.

We live in an age of progress, and in order to keep abreast of the times in business, as well as in professional life, we must be able to accomplish more than our predecessors, with little or least danger, at a small cost, and satisfaction to all concerned. Perhaps nothing in the realm of surgical progress has been a greater boon than the advent of local anaesthesia, in accomplishing difficult surgical operations painlessly. Of the many conditions in which cocaine can be employed, there are none more admirably suited for its use than the performance of the operation for the radical cure of inguinal hernia. It is to be borne in mind that I am not heralding this method with the hope of asking for originality, but merely to bring to the mind of those who are engaged in surgical work the advantages of local anaesthesia in the execution of this procedure, being supported by the classical work of Bodine, Cnshing, Mitchell and others, and my own experience with thirty-two cases.

Now, to use this method with success, first of all one must have an exact knowledge of the inguinal rings, inguinal canal and the nerves, cocainization of which allow the easy application of the method. For this reason I will review briefly the important points in connection with the anatomy of the site:

The canal is merely an oblique slit or flat-sided passage. The external and internal rings are so blended intimately with the structures that pass through them, and so filled by them, that they are potential rings only. The external ring is formed by the divergence of two fasciculi of external oblique aponeurosis, and two crura, superior attached to symphysis, and blending with suspensory ligament of penis; inferior attached to pubic spine and blending with Pourpart's ligament, and so with fascia lata. On the inferior pillar rests the cord, and so the weight of the testicle, or round ligament.

1. Boundaries of Canal.—Floor: Where cord rests on grooved upper margin of Pourpart's ligament. The meeting of transversalis fascia with this ligament forms the floor.

2. Roof.—The apposition of the muscles and the arched border of the internal oblique and transversalis.

3. Anterior Wall.—Skin, superficial fascia, external oblique all the way. Internal oblique, i. e., that part arising from Pourpart's ligament for the outer third.

4. Posterior Wall.—For whole extent transversalis fascia, extra peritoneal tissue and peritoneum.

The nerves concerned are the inguinal branch of the ilio-inguinal, genital branch of the genito crural, hypogastric division of the ilio-hypogastric. These nerves have their origin from the first and second lumbar trunks. At times these three can be found, but the ilio inguinal as a rule is always found, the same running from the iliac crest inwards and resting upon the surface of the internal oblique. If one observes carefully, small intercommunicating fibers can be seen, thus accounting for loss or partial loss of sensation in one trunk if its fellow is cocainized. One important point to be borne in mind relative to this nerve is that its end distribution is to the skin of the upper and inner part of the thigh, its fibers for this innervation passing through the

Read before Medical Association of Georgia, Macon, Ga., April 22-25, 1909.

external ring along with cord. How these are treated will be mentioned later.

The ilio-hypogastric may be absent, and in the course of the operation, if same is not seen, do not lose time in searching for it, but infiltrate around arched fibers of internal ring, and its fibers will be caught in area of infiltration.

The genital branch of genito-crural at Pourpart's ligament turns around the inferior epigastric artery, and enters the canal, accompanying the spermatic cord in the male and the round ligament in the female. It is behind the hernial sac and has little pain-bearing significance.

To enable one to better appreciate location of nerves, I have had drawing made.

PREPARATION OF PATIENT.—The patient is subjected to the same preparation as would be given for the general anaesthetic, though I never object to a light breakfast the morning of the operation. As a preliminary measure to allay fear and restlessness, I give morph. sulph. one-eighth grain and whiskey one-half ounce one half hour before operation, or, better, have same ready to be given as patient leaves room for operating room. Should there be any danger of toxic effects, the morphine and whiskey will antidote same.

It is well to mention that one should study his patient and succeed in getting his entire confidence and belief in the feasibility of the method. Suggestion will go a long way, and if we observe Bodins in his clinic during the performance of a local anaesehesia hernia, one will note the patient indulging in jokes with the same avidity as the operator.

TECHNIC.—First of all, the surgeon must be calm and deliberate. Nervousness on the part of the surgeon tends to make a nervous and excitable patient.

The attitude of the patient on the table should be one of comfort, or as comfortable as one could be made. If the patient's arms are not so placed over the chest as to be comfortable, we will have the misfortune of breaches in technic through the patient's ignorance, in his efforts to make himself comfortable.

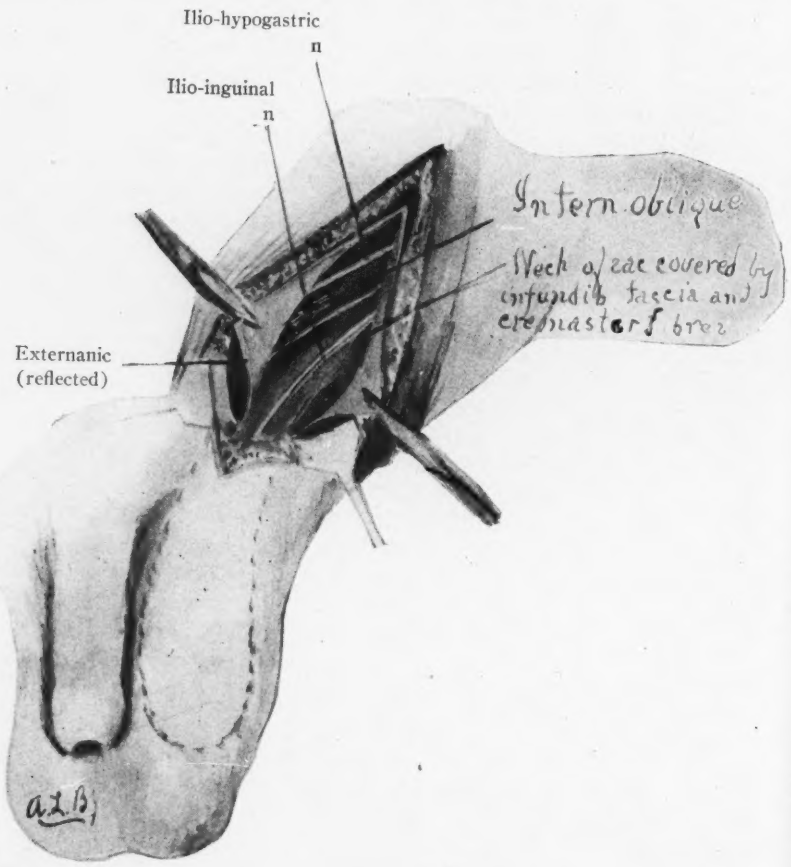
The patient should be informed of the first step in the operation, i. e., infiltration of skin. He will then be prepared for the little prick of the needle, and then his pain is no more. In introducing needle, always introduce it with bevel edge downward, and there is less danger of point emerging before infiltration is complete.

Infiltrate in such a manner as to produce a decided pallor in the infiltrated area, and continue without removing needle, until it has reached its hilt. Always be careful to reinsert the needle in a pre-anaesthetized part, or else we have a repetition of the pain of the first puncture. The infiltration should stop at the supra-pubic skin fold in order to avoid the venous plexus of mons veneris. The use of gentle retraction will enable us to work without a long incision.

Now the deeper layers of the skin should be infiltrated by carrying the needle to the hilt, and depositing the contents of the syringe into the tissues. These infiltrations should be about one inch apart. We are now ready to make an incision down to the aponeurosis of the external oblique. Never ask assistant for a knife, for I have observed how fearful some patients are of being cut, but ask for a scalpel and sweep down to aponeurosis of external oblique without patient's knowledge. At this point the use of dissecting forceps and scissors in clearing up the aponeurosis is to be preferred to blunt dissection. The bleeding is at times troublesome, though as a rule the paucity of blood vessels at this site enable us to dispense with many clamps. The clamps should be applied with ease and gentleness. No rough sponging to locate bleeding points or roughness of any sort is allowed.

After having cleared the external oblique, remember that fibers of the ilio-inguinal pass out of the external ring to supply the thigh. Here infiltrate the pillars of the ring to include these fibers. Now beneath the proposed line of incision in the external oblique,

infiltrate sparingly down to the external ring, in order to include small nerve filaments branches of larger nerves that may be attached to the under surface of the external oblique. Instead of dividing the external oblique at the ring, first begin and cut from above downward and avoid the ilio-inguinal avoidable. The aponeurosis is now stripped back with care, and the nerves, the key note to the situation, present themselves. As mentioned before, the ilio-inguinal is most constant and can be seen with distinctness. The needle is carried into the sheath of the nerve and a few drops of solution deposited. The



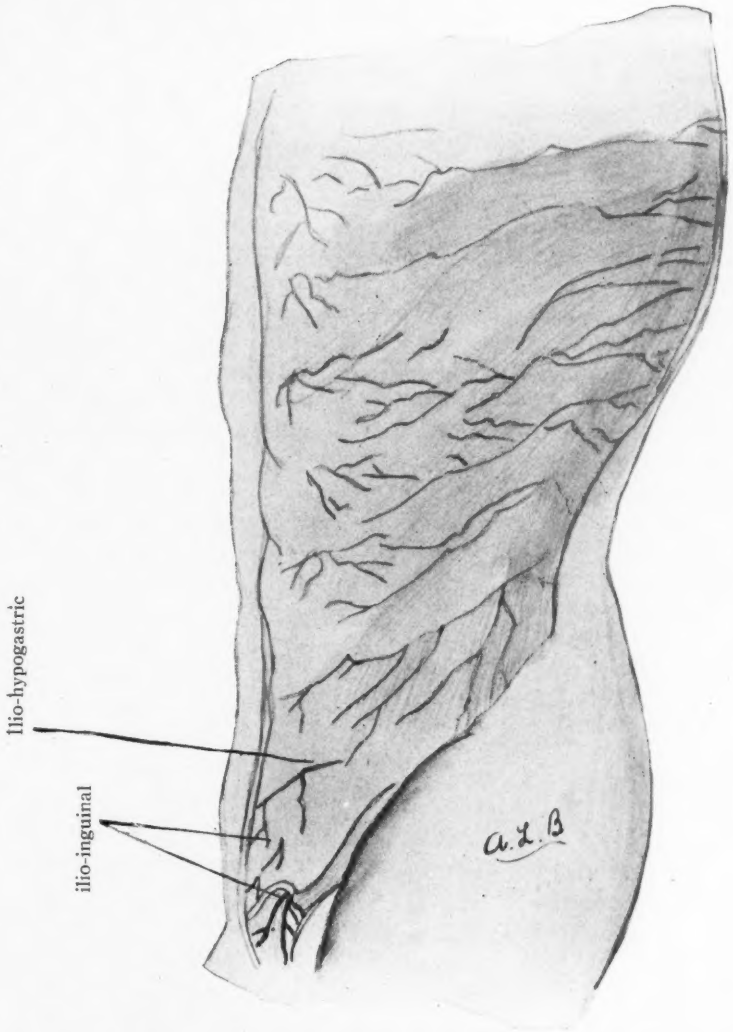
SHOWING USUAL SITUATION OF NERVES AS EXPOSED A. TER REFLECTION OF THE DIVIDED APONEUROSIS.
(After Harvey Cushing.)

fibers. It is not anabsolute necessity to divide the external ring in cases that are not complete, but in this event the aponeurosis must be divided higher up, in order to enable retraction of same. I believe, as does Mayo, that it is wise not to cut the external ring if nerve stands out as a fibrous cord. If other nerves are seen, cocainize them.

The sac is now approached, and the chief aid in finding it will be the patient's help He is told to cough, and immediately the sac springs into view. It is then caught with for-

ceps and with occasional "helps" from the patient, it is dissected away from the cord. Open the sac and return the contents. Should there be adherent omentum or appendix, this anaesthetize the intestinal coats, provided there is no tympanites.

Before transfixing and tying the neck of the sac, it should be infiltrated.



SHOWING LOCATION OF ILIO-INGUINAL FIBERS AS NERVE EMERGES FROM EXTERNAL RING.
(From Morris Anatomy.)

can be amputated without additional infiltration, painlessly, as I have done in two cases. Meltzer has demonstrated that the introduction of cocaine in any part of the body will

The question of dealing with the cord painlessly, in the attempt to transplant same, deserves consideration. A few drops of cocaine in the vas will prevent nausea, that is

sometimes experienced at this part of operation, due to drawing on cord.

Separate the cord with gentleness and care from its resting place on the shelving border of Pourpart's ligament, and cocainize the genital branch of genito crural, if seen.

The remaining part of the technic is carried out as is the ordinary Bassini method. The conjoined tendon is sutured to the shelving process of Pourpart's ligament, the cord is transplanted and the aponeurosis is closed by running suture. The skin incision can be closed, one hour and a half after infiltration, without pain.

Could one conceive of a greater boon to mankind than this method! Bodine says: "The one dread of a patient is general anaesthesia, and it is well to be dreaded, for the mortality in inguinal hernia in good hands is the mortality of the anaesthetic." We could hardly think of the toxic effects of cocaine when less than one-half of a grain is used to complete the entire operation, and this amount is injected during one hour.

In some cases of strangulation it is really imperative. By its use we are enabled to watch and apply towels to a strangulated gut for an hour or more, and the patient suffers not, in the least, by the delay and sesection is frequently rendered unnecessary.

The danger of post operative vomiting is eliminated, and the integrity of our structures remains unimpaired.

It is a known fact that primary union depends upon little traumatism, and the gentleness necessary in the performance of this operation enables the tissues to heal by first intention.

When we perform this operation under general anaesthesia the nerves are of secondary consideration, but in cocaine surgery we respect them and the muscles enervated by them retain the same vitality as before the operation.

Solution—The solution should be freshly prepared, one grain to one ounce of sterile water. The addition of a few drops of chloretone will keep the solution indefinitely, but it is just as well to have a fresh solution.

Completeness of Operation—This is a question that may be asked. The operation can be accomplished with the same degree of thoroughness that is displayed with general anaesthesia.

In regard to recurrences, I have seen two out of a personal experience with thirty-two cases. One in which I did not transplant the cord, the recurrence occuring after a fit of sneezing, the other in a woman who was six months pregnant at the time of operation. She had a recurrence after her pregnancy. Unfortunately, she had so much trouble, owing to the death of her husband, thus losing weight and strength, that I hardly think hers a test case. Bodine has had remarkably few recurrences in 500 cases, certainly not more than would have occurred under general anaesthesia.

I wish to add that in very fleshy subjects the possibility of some pain should always be stressed, but Bodine, in a recent article in Annals of Surgery, says that fat is no contraindication, and in fatty subjects, suffering with heart or kidney lesions, local anaesthesia should be used. I have had some pain in fatty subjects, but none have complained that it was severe enough to deter them in having a similar operation if it were necessary.

Strangulated Congenital Hernia in Infant Four Months of Age.

Operation—Recovery.

J. W., age, four months. Residence, Jones Street. Referred by Dr. W. W. Battey, Sr.

Family History—Mother died of pulmonary tuberculosis two weeks after birth. Father living in sound health.

Past History—Has been a bottle-fed baby. Has congenital umbilical and inguinal hernia.

Present History—On 17th of December, 1908, the child became very fretful, and grandmother was unable to quiet it. In removing diaper she noticed a tumor in groin that she could not reduce, as she had hereto-

fore done. Slight vomiting at intervals. She at once called Dr. Battey, Sr., who saw the child at 4 P.M. I saw the child at 5 P.M., and advised immediate operation, notwithstanding age of infant. The child was hurried out to the hospital, and I operated at 8 P.M., assisted by Dr. Bernard and house staff. Found a strangulated congenital inguinal hernia, constricted at internal ring. Bassini technic carried out. Child left hospital in two weeks, and wound healed by primary union, notwithstanding constant urinary discharge on dressings.

One point of interest in the case, is the fact that Dr. Battey, Sr., administered chloroform for one hour and reported hardly a variation in pulse beat.

This case I report to show that age should never be considered a contra-indication to operation, if there is absolute need for surgical intervention.

STRANGULATED INGUINAL HERNIA IN ADULT. *Resection of Eight Inches of Small Intestine.* Lateral Anastomosis—Recovery.

Willie Fulton, Union Point. Referred by Dr. H. C. Foster. Age, 25 years. Family history, negative.

Past History—Has a congenital left inguinal hernia which has been reducible up to present time.

Present History—Five days ago was taken with pain in groin. Hernia became irreducible. Nausea and vomiting. Abdomen tense and slightly distended. Large tumor mass in groin, painful upon palpation. Pulse frequent and small. Dr. Foster saw patient only on day that he sent him to hospital.

Immediate operation assisted by Dr. Bernard and house staff. General anaesthesia by Dr. Battey. General anaesthesia was used, owing to fact that extensive resection was thought to be necessary. Upon opening sac, sero-sanguinous fluid, faecal matter, and gangrenous bowel were found, the bowel having sloughed through at one point. Sac was thoroughly irrigated with salt solution before traction was made on bowel to develop healthy bowel. Gangrenous bowel and mesentery divided and resected between clamps. Ends of bowel closed by ligating with cat gut and inversion. Lateral anastomosis according to Mayo, using Roosevelt clamps. Bassini technic. Patient reacted well.

With exception of some pressure necrosis of skin, had no trouble, and left hospital in three weeks.

MAXILLARY SINUS DISEASE AND ITS SURGICAL TREATMENT

By M. M. CULLOM, A.B., M.D., Nashville, Tenn.

Empyema of the antrum of highmore has long been known and its gravity recognized. But it is only within comparatively recent years that its frequency has been appreciated. The erection of nose and throat work into a separate branch of medicine has concentrated the attention of many accurate observers to these regions with the result that our knowledge of sinus disease has been wonderfully extended.

The activities of the nose and throat men, from above and that of the dental surgeons from below have contributed much to our knowledge of the etiology of antrum empyema. The dental surgeons claim that suppuration in the antrum comes almost exclusively from disorders of the teeth, while some nose and throat men think that suppuration is nearly always the result of intranasal trouble. My own experience would lead me to think that the majority of cases are the result of infection through the teeth.

Killian believes that most cases arise primarily and quotes Frankel's pathological researches to support his view.

Influenza and the exanthemata are undoubtedly the cause of many cases from their propensity to attack the nasal mucous membrane. Nasal polypi have been named as a cause, but it is more likely that the suppuration is the cause of the polypi from their tendency to cease forming when the diseased sinus is drained. We must not fail to mention the cases in which the infection comes from above, from the frontal sinus or ethmoidal cells.

The pathological changes which take place in the maxillary sinus are mainly those of a chronic inflammatory character followed by polypoid and cystic degeneration, periostitis, rarefying osteitis and caries. Caries, as a result of sinus suppuration, is exceedingly rare. Zuckerkandle never observed caries as a result of empyema.

The symptoms complained of most are discharge, odor and obstruction to nasal respiration. Many obscure neuralgias have been traced to suppuration in the antrum. Postnasal catarrh is often present and is sometimes the only symptom complained of. More remote symptoms are cough and recurrent attacks of laryngitis and bronchitis. The discharge of pus into the stomach may set up gastric disturbance, vomiting and diarrhoea. Added to these symptoms are those of loss of weight, ill-health and the general line of symptoms due to septic absorption.

The diagnosis of antral suppuration often presents difficulties. The first point is the establishment of the presence of pus in the nasal cavity. Then the problem is to locate the sinus from which it issues. The patient usually comes complaining of a "bad catarrh." If the patient complains of trouble in one nostril accompanied by a unilateral discharge, characterized by a foul odor which is offensive to the patient, we should at once figuratively sit up and take notice, for such a train of symptoms is almost pathognomonic of sinus suppuration. In point of frequency the antrum is oftener diseased than all the other sinuses combined, and in a given case we would expect to find the origin of the pus in the antrum. The first thing to do is to inspect the teeth (upper) on the corresponding side to see if caries is present.

A history of abscesses at the roots of these teeth is helpful. Bad teeth on the affected side

points strongly to the antrum. A valuable sign is the posture test. After thoroughly cleansing the nostril of pus the patient is directed to lean forward with the head almost between the knees with the affected side up. This position brings the natural opening of the antrum into the lowest plane and favors the discharge of pus. The presence of pus in the middle fossa after this test would point to the antrum. The text books erroneously ascribe this test to Fraenkel, but as I will show later it was described nearly two hundred years ago by Laurent Heister, a German surgeon.

The only sure sign of the presence of pus in the antrum is obtained by puncture. This is best accomplished by piercing the antrum with a trocar underneath the inferior turbinate and attaching a syringe to it. A small quantity of a sterile solution is injected into the antrum and allowed to flow out through the normal opening. The presence of pus in the solution is conclusively evidence of suppuration in the antrum. It is needless to say that the nose should be thoroughly cleansed of pus before this procedure is undertaken.

Transillumination is a valuable means of diagnosis. While unsatisfactory in some cases there are many times when it affords most valuable evidence.

The diagnosis having been assured, the question of treatment arises.

The acute infections should not be operated on except in the most urgent cases. Most acute cases of antrum suppuration will resolve under palliative treatment.

In cases of chronic suppuration the presence of carious teeth should be looked for and removed if found. I have known many cases to recover simply from removal of offending teeth.

Removal of the anterior tip of the middle turbinate and washing out the cavity through the natural opening should be practiced. This will sometimes result in a cure. Even exploratory puncture and washing through the tube has been followed by cure. But there are many cases which will resist these mild measures and permanent drainage will have to be established. More than two hundred years ago, in 1707, the celebrated English surgeon Cowper devised and practiced the operation through the alveolar border. Laurent Heister, the great German surgeon whose work on surgery was published in 1739, thus describes the condition and operation:

"We meet with a new method of treating a particular species of the ozoena described in the anatomy of Dr. Drake, in which the ulcer is seated in the antrum highmorianum, or sinus of the upper jaw, discovering itself chiefly by the disagreeable smell and corrupt matter which runs out o, fthe nose upon inclining the head on the sound side, because in that posture the matter is turned out of the maxillary sinus. But as we are not able by this, or any other means, to clear the matter from the sinus, this species of the disorder frequently remaining incurable and at length destroys the patient for whose relief Dr. Drake has supplied us not only with a true notion of the disorder, but also with a new method of curing it as follows: Being sure that the ozoena is fixed in the antrum, he orders one of the molar teeth of the affected side to be extracted, and then to break through the alvearus or socket into the sinus by a probe, or other sharp-pointed instrument like that represented in Tab. VII, Fig. 2, which, he says, may be generally performed without much difficulty, because this point of the bone is usually much decayed or erroded by the retained matter. Having thus made an opening into the sinus, you have not only a ready discharge of the offending matter, but may also afterwards deterge and heal the parts affected by thrownig in proper injections, composed of Elix. Prop. vel Tinct. Myrrh Alo either alone or mixed with a decoction of scordium or savin, with some Mel. Rosar. After your medicine is injected into the sinus you must retain it there some time by immediately stopping up the aperature in the gums by

a tent, after removing which and discharging the injection you must insert another tent fastened to a thread and intended to keep he passage from closing up before he ulcer is deterged and healed in the antrum. The success of this practice is confirmed by repeated experience, and it is remarkable that the upper jaw bone is some times so much eroded by the confined matter that a great part of it comes away together with the tooth extracted, so that you need not make an aperture into the sinus, that being, by this means, already performed to your hand and you have nothing more to do than to treat the ulcer with detergents and balsamics to complete the cure.

NOTE.—The method of treating an ozoena with several other cases in Drake's Anatomy are said to have been inserted by the celebrated anatomist and surgeon, Mr. Cowper, but how justly I must leave others to determine."

It will be seen from the above that Heister was familiar with the posture test and that it is an error to speak of it as Fraenkel's test. It should rather be called Heister's test.

About one hundred years ago the operation through the canine fossa was devised. These two methods were the only operations in use until 1893, when Caldwell devised the operation through the canine fossa with a counter opening through the nasal wall for permanent drainage. In 1895 the method of Miculitz and Krause was published, which consists of an opening through the inferior meatus underneath the inferior turbinate through which the cavity may be syringed and treated. These two methods have practically superceded other operations and both have their warm advocates. The point in both operations which makes them far superior to the older procedures lies in the establishment of intranasal drainage. Where a permanent opening is left into the mouth, the oral secretions and food particles act as a constant source of infection. Likewise it is exceedingly disagreeable to the patient to have pus draining into the mouth. On the other hand, the mucous membrane of the nose and the antrum are continuous through he natural opening, and the secretion of the nose does not infect the antrum.

These considerations make the intranasal far more desirable than oral drainage.

It may be said for the Caldwell-Luc method that it is an exceedingly thorough operation.

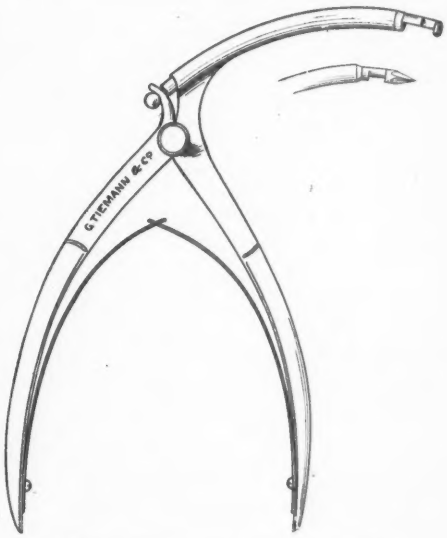
The large opening through the canine fossa permits of the complete inspection of the cavity and the removal of any abnormalities which interfere with the drainage and prevent healing. On the other hand, it entails the use of a general anesthetic, is attended with a certain amount of shock, and may cause troublesome hemorrhage. A neuritis as a result of injury to the dental nerve may follow. For the operation through the nasal wall it is claimed that it can be done under local anesthesia, that there is no shock, that the sinus can be sufficiently curetted hrough the opening with malleable curettes, and that most cases will recover under this operation, and that if the canine fossa operation becomes necessary, a part of it has already been done, working a material shortening of the radical operation. I think these reasons outweigh those urged in favor of the radical operation and believe that the opening through the inferior meatus is the first operative step that should be undertaken. The method of opening the antrum through the inferior meatus is as follows: A solution of cocaine 8 per cent is mixed with an equal amount of adrenalin solution. Plegets of cotton soaekd in this solution with the excess squeezed out are packed underneath and around the anterior end of the inferior turbinate.

After anesthesia is induced, the anterior third of the inferior turbinate is divided at its attachment with a pair of turbinectomy scissors, preferably of the serrated variety. The anterior third of the turbinate is then removed with the cold wire snare. After checking what hemorrhage follows an opening is made into the antrum with the trocar punch attached to my back-cutting forceps. After making an opening, I introduce my back-cutting forceps

and enlarge the opening anteriorly. I try to get an opening three-quarters of an inch in length and from one-quarter to one-half of an inch in height. The cavity is then gently curetted with a Myles malleable curette and packed with sterile gauze. The gauze is removed in twenty-four hours and is not replaced. The cavity is irrigated every third day with a warm boracic acid solution until the discharge ceases. This may come about in three weeks to three months. After a week I give the patient a silver eustachian catheter and douch bag and teach them to carry out this procedure themselves.

I wish to report the following case as illustrating the advantage of this operation over the radical canine fossa operation:

Mrs. C., aged 65, referred to me by Dr. S. J. Rollow, of Edgoten, Ky., 1908. She came on account of a severe attack of herpes zoster ophthalmicus. There was deep ulceration along the course of the supraorbital nerve and to a less extent along the infraorbital. She had been suffering agonizing pain for weeks which had necessitated the use of morphia, and I found her in a very depressed and run-down state. In giving her history, Dr. Rollow said she had been suffering from a foul discharge from both nostrils for eight years. The patient dated the discharge from the time she had her teeth removed. Doubtless the trouble which necessiated the removal of the teeth was the cause of the antrum trouble. I found on inspection both nostrils contained pus of a foul odor, which issued from the region of the middle meatus. After carefully cleansing the nose the posture test was applied and presence of pus was demonstrated in the middle meatus. The history of the carious teeth followed by foul discharge and the confirmatory posture test caused a diagnosis of double antral empyema. The age of the patient, her physical condition, and the fact that both antra were involved, led me to advise against immediate operation. I therefore proceeded to treat the deep ulceration on the scalp and forehead and instituted preliminary measures looking to operation on the antra. The discharge of pus wa sso profuse and the history of suppuration extended over such a length of time that I presumed a radical operation woulo be necessary. On the left side I removed the anterior tip of the middle turbinate and every day washed out the antrum through the natural opening. A deflection of the septum prevented access to the natural opening on the right. I washed out large quantities of foul inspissated pus on the left side. Under this treatment the pus decreased greatly in quantity and the odor disappeared. After ten days' time I removed the anterior third of the inferior turbinate on



CUT ILLUSTRATING MY ANTRUM PUNCH.

the left side and a few days later the anterior third on the right. On account of the age and condition of the patient I wished to shorten the operation by doing as much preliminary work as possible. In the meantime I had been thinking of the feasibility of the intranasal operation. The patient's age, physical condition bilateral suppuration as well as her nervous dread of the hospital and anesthetic caused me

to decide on the intranasal operation. I removed a spur which interfered with access to the inferior meatus on the left side, and two days later operated on both antra at one sitting under cocaine anesthesia. She suffered no pain during the operation and no shock as a result. I allowed her to return to her home in Kentucky three days later after instructing her daughter in the use of the douche. It was douched every third day for six weeks, when the discharge ceased in the right side. The douching was kept up in the left side until she returned to me in the early part of February. I found the right side absolutely clean. It had not been douched in more than a month and I could not get a trace of pus. There was a very slight discharge on the left side. The opening had not shown any tendency to close on either side. The patient was the picture of health and had gained considerable weight and was in active discharge of her rather heavy domestic responsibilities.

I append a cut of my antrum punch, showing the blunt and trocar points.

UNCINARIASIS

By CHAS. P. McNABB, M.D., Knoxville, Tenn.

Uncinariasis, "miner's anemia," "dirt eating," "tunnel anemia," and "ne gro consumption" are some of the many synonyms of hook worm infection.

This infectious disease is now recognized as being prevalent in practically all tropical and sub-tropical countries.

In European countries it is caused by the ankylostoma duodenalis and on this side by the uncinaria America. Both parasites belong to the sub-family uncinariinae, but are of two distinct species of that family. According to present theories the developmental cycle of the uncinaria and its entrance into the human system and route to its resting place or home in the small intestine is to my mind one of the curiosities of clinical parasitology.

Infection having occurred, the adult female worm deposits her eggs in the intestine to be thence expelled with the feces, when, if the necessary conditions o fheat, moisture and a soft loose soil are present, develops in a few hours an embryo which sheds its skin in forty-eight to seventy-two hours. In about one week a second ecdysis occurs which prepares and qualifies the larva for infecting human beings, which it is believed takes place in two different ways: 1. By way of the alimentary tract, entering with food and drink, and, 2, through the skin, and, curiously enough, it seems that infection through the integument is by far the commonest route.

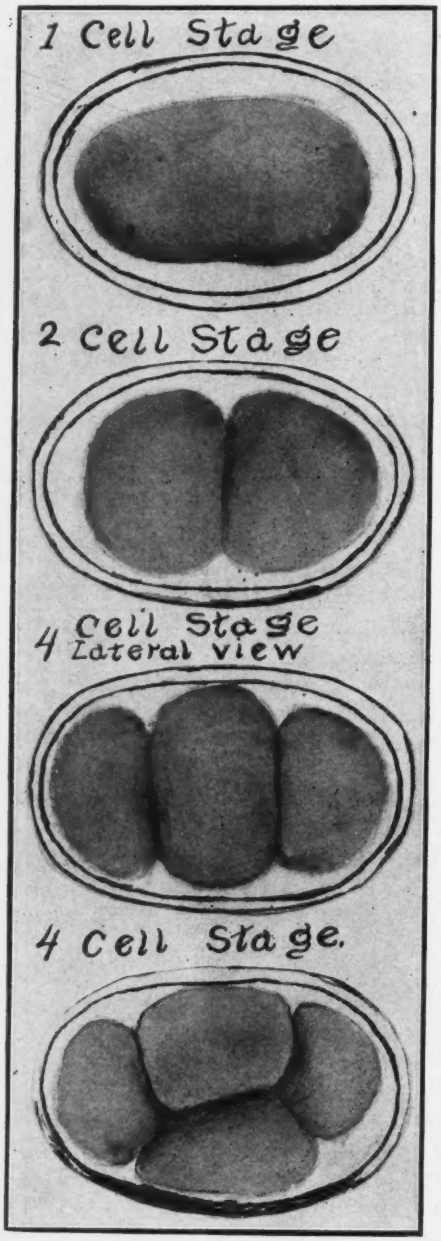
Looss' theory, which is now generally accepted, is that after the larva penetrate the skin usually of the feet, and thus gain the circulation, they pass with the veinous blood current to the lungs, where they escape from the blood through the alveolor epithelium to the bronchi, thence to the mouth, to be swallowed into the stomach, from which they reach the intestinal mucosa, and to which they attach themselves and gro winto mature hook worms. I am not competent to criticise this theory, but it looks like "going around Robin Hood's barn to enter the rear door," for if they were able to perforate the unbroken skin in the ebginning of their migration it seems to me far more probable that they stick to the blood stream until they reach their goal, the intestinal mucosa, through which they could migrate almost as easily as the lung tissue, and much easier than the skin of the feet. Having thus succeeded in reaching the small intestine, the larva begin at once their vampire-like existence of biting, blood-sucking, growing and ovipositing their eggs, which in turn must follow the same cycle of the parents if they propagate their species.

Pathology.—The stomach is often found dilated and there is usually catarrhl inflammation with excessive mucus secretion and decrease of the digestive ferments. There is catarrhal inflammation of the intestinal mucosa, which is thickened and ecchymotic and punctured with the bites of the parasites. Some times the entire wall of the intestine is attenuated and dilated, but oftener it is thickened and occasionally strictures are seen. The muscles, both voluntary and involuntary, are soft and flabby, whence follows weakness and prostration, and in every advanced case that I have seen there was an enlarged and dilated heart.

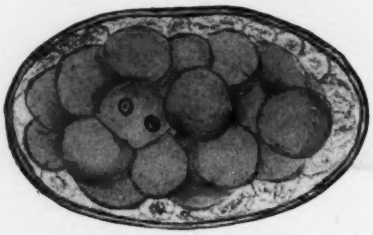
The blood shows constant impoverishment

Read before the Knox County (Tenn.) Medical Society, September 9, 1909.

in cases of even moderate degree. Hemoglobin and red cells going down so closely together that the color index remains nearly normal.



Anemia is constantly present, and in cases of moderate severity hemoglobin drops to 50 per cent or below, and the erythrocytes fall to 3,000,000 or to 2,000,000, and polychromatophilia and poikylocytosis appear. Leucocytosis of marked degree is not present, but a decided increase in eosinophiles is often seen and is said ot be a favorable prognostic sign.



DIBOTHRIOCEPHALUSALTUS.
(Fish Tapeworm.)

Symptoms.—Stiles divides the cases into *"light," "medium,"* and *"severe."* Light cases may present few or not any symptoms, and thus escape diagnosis unless their true condition be accidentally discovered, but hook worm infection is attended by a toxaemia that leaves its finger marks in even the mildest case and which should attract our attention if other definite cause is not apparent to explain the lassitude, easy fatigue, disinclination to physical or mental exertion, and slight digestive disturbance, and lead us to a careful microscopic search of the feces for uncinaria eggs. All grades of the disease pass imperceptibly into the next, and when they reach the *medium* and *severe* form the clinical picture is impressive but often misleading, and always so if carelessness or slipshod methods of diagnosis are adopted. If infection occurs in childhood, development is retarded, both physical and mental. A man 25 years old looks like a boy of 17 or 18. The voice remains childlike long after puberty and hair grows sparsely on the pubes, in the axilla and the beard, but as the hair of the head had previously attained its growth, it remains unaffected by the disease. The skin is dry and harsh, pale, sallow, or dirty yellow, or gray.

Petechia are occasionaly seen, and a papular eczema-like eruption or a dermatitis between the toes, on the sides and top of the feet (ground itch), may be mute evidence of the entrance of the parasites into the body. *Oedema* of the2 face (especially the lower lids), feet and ankles, and ascites, are not uncommon, and in severe cases general dropsy is occasionally seen.

The heart is almost invariably enlarged and dilated, the apex being displaced downward and outward, and until great weakness of the heart muscles appears, the apex beat is forcible and diffused. Later, and in very severe cases, it grows feeble and is plainest seen and felt in the epigastrium. Relative insufficiency causes mitral and tricuspid regurgitations, and anemic systolic murmurs play hide and seek at the pulmonic and aortic valves and in the arteries at the root of the neck, whose visible pulsations are sure to attract our attention. *Temperature* may be normal, sub-normal or elevated. In my limited observation it has been oftener sub-normal until the disease is far advanced, when a fever of 100 to 101 is not uncommon, either a toxic phenomenon or the fever of *anemia,* I know not which. The urine is pale, of low s. g., sometimes contains a little albumen and is abundant in quantity until the failing heart muscle can no longer furnish the vis-a-tergo to the kidney circulation sufficient to enable them to excrete properly, at which time concentration and diminution follow.

The appetite varies from poor to ravenous, abnormal, or perverted. Some of the perversions of the apetite are strikingly disgusting, and the habit of eating dirt or mud is responsible for one of the common synonyms of the disease, to-wit: *"Dirt eaters."* The abdomen is often enlarged and feels doughy. Digestion is impaired, and constipation and diarrhoea frequently alternates in the same patient. After all has been said of signs and symptoms, we must look to the faces for conclusive information, for a positive diagnosis. The microscopic appearance of the excreta frequently shows mucous from the associated catarrhal inflammation of the intestines, and blood from the bites of the hook worm and sometimes the mature worm is thus seen. Microscopic examination reveals the presence of the parasitic ova. When the ova were present in the stools the benziden or guaiac tests in my hands have always shown the presence of occult blood. I also have been much impressed with the invariable loss of pancreatic function as shown by the presence of large numbers of meat fibres with sharp broken ends and well marked stria, and suggest as a probable explanation an inhibiting effect on the pancreas of a toxin produced by the parasites.

To facilitate the finding of the ova, Boas suggests a very simple and effective method, to-wit: Rub up 2 to 4 c c of fecal excreta with water in a mortar or test tube and then add 90 per cent saturated solution sodium chloride and allow the mixture to stand a few minutes, when, the eggs being lighter than the salt solution, float to the top and can be transferred to the slide in greater numbers than where particles of fecal matter are spread directly on the slide. It takes a little more time, but, in the author's opinion, it is well spent. The eggs of the hook worm are easily seen without staining when present in the field of a low power lens, and they are recognized by their oblong shape, rounded ends, thick capsule, and the dividing of the protoplasm into two and four segments, or cell divisions. Tape worm egg ssomewhat resemble those of uncinaria, especially that of the "Dibothriocephalus Latus," or fish tape worm, but the thinner capsule and more numerous cell divisions of its protoplasm, together with its rounder form, make differentiation easy.

The "blotting paper" fecal test has twice enabled me to make a diagnosis in consultation visits away from the city and later microscopic examinations proved them to be correct. The test consists in wrapping a portion or all of a bowel movement in white blotting paper, and if uncinariasis is present the paper will show after a few hours a reddish or pink stain.

Diagnosis.—Is easy or difficult in just proportion to the degree of thoughtfulness and thoroughness of the examination. I have a patient now under treatment whom I present as a clinic this evening, that was sent from "post to pillar" for treatment, first for Bright's disease, then for organic heart disease, and I misdiagnosticated his disease as "pernicious anemia" at my first effort.

Prognosis is favorable, proper treatment being excedingly effective if the vital forces and recuperative powers have not been completely exhaustd before treatment is begun. But if appropriate treatment is not instituted and carried out, the mortality is appalling. Ashford, King and Gatierrez, after careful investigation, express their belief that 30 per cent of Porto Rican deaths are caused by uncinariasis. The Porto Rican Commission reported of 5,490 cases, 40.8 per cent cured; practically cured, 6.8 per cent; improved, 31 per cent; unrecorded and never returned cases, 18 per cent; unimproved and died, 0.5 per cent.

Treatment.—Prophylaxis demands rigid care of the stools in all cases, and that this may be done it is of vital importance that "light" grades of the disease be recognized. Privy vaults should be used by such patients, and where that is not possible, vessels should be used instead, and the stool thoroughly treated with chloride lime or strong solution sulphate copper before it is emptied on the ground or in the sink, as the eggs might otherwise be washed ashore and find their way to a suitable soil for development. It goes without saying that those handling such stools or such patients should not recklessly expose the hands and fingers to infection. In fact, the alliteration, "Food, fingers and flies," quoted so often as potent factors in the dissemination of typhoid fever, might well apply in uncinariasis.

Medical treatment for the expulsion of the parasites consists in first sweeping out as far as possible the mucous which may cover and protect the hook worms from the remedies administered for their destruction, to-wit: Thymol, Beta Naphthol and Extract of Male Fern. Thymol is the favorite, and is given in two doses of 30 grains each on an empty stomach. The first dose is given about 8 a. m., the second two hours later, and at 12 o'cloc knoon a dose of Epsom salts follows and expels the Thymol. It is important that no food be eaten or alcohol or oil be given until afte rthe Thymol has been passed from the bowels, as dangerous symptoms from its absorption might thus occur. Beta Naphthol is used in the same way, but in half the dose as Thymol. Extract Male Fern is used 4 to 8 c c at one dose, followe dby salts in about two hours. A somewhat limited practical experience has convinced me that this treatment should be repeated in one-half the above prescribed doses every eight or ten days for four or six weeks, and in the meantime a course of tonic treatment suitable to the indications in each individual case should be followed and assidiously applied.

THE DIAGNOSIS OF SYPHILIS BY THE WASSERMANN REACTION

By WILLIAM LITTERER, A.M., M.D., Nashville, Tenn.
Professor Bacteriology and Pathology, Vanderbilt Medical College.

The scientific medical world is ever ready to herald any advancement in the refinement in diagnosis of this world disease, especially when we consider that there is probably no infection which at times offers greater difficulties in diagnosis than syphilis. It is true that the therapeutic test is quite valuable, but it falls far short of being a practical and scientific diagnostic measure. The confirmation from many workers as to the utility of the serum test seems now to have reached a stage where it can be used as an actual laboratory aid in diagnosis. In 1906, Wassermann, Neisser and Bruck[1] published a series of experiments demonstrating in vitro syphilitic antibodies in blood serum and specific material in syphilitic tissues. Later, Wassermann and Plant[2] found syphilitic antibodies in the spinal fluid of 78 per cent in 41 cases of progressive dementia.

This was the first application in clinical medicine and has ever since been known as the "Wassermann Syphilitic Reaction." Wassermann and others showed that in the serum of syphilitic apes a substance was produced which was not present in normal serum, and later they discovered that when the blood serum of syphilitic individuals was added to liver extracts of a luetic still-born the complement was anchored.

The researches of Bordet and Gengou in 1901 paved the way for this reaction, since the principle consists in the binding of the complement, a phenemenon first observed by these investigators on emulsions of bacteria.

It is a well established fact that if the blood of animal (A) should be injected every seven or eight days, for several inoculations into another of a different species (B), the serum of the latter will disintegrate the red blood corpuscles of the former, producing what is known as hemolysis. The dissolution of the red blood cells is dependent on two substances, each cannot act without the other. One of these is always present in any blood serum, and is called the complement. It is thermolabile, i. e., its destruction occurs when heated to 58° C. F. for one-half hour. By heating said serum it is rendered "inactive," hence the term "inactivated" is used when the complement is destroyed. The other substance necessary for hemolysis, known as an antibody or hemolytic amboceptor, results from the reaction of the injected animal against the injected blood cells. It is thermo-stabile, i. e., it withstands heating to 58° C. There are vast numbers of antibodies. No two are identical. They are specific and are the reaction product formed in the blood of an animal when a given substance, toxic or otherwise, is injected into it. So all substances, which, when injected into animals, are capable of producing antibodies, are, in general, called "antigens." If typhoid bacilli were injected into a guinea-pig every seven or eight days for several weeks, there will appear in the guinea-pig's serum a substance that will dissolve typhoid bacilli. This substance contains two bodies, (1) complement and (2) bacteriolytic amboceptor or antibody, which is analagous to the substance produced by the injection of red corupuscles into an animal of

another species, but differing materially in their antibodies. These substances contain identical complements which are always present in any animal. The antibodies are manufactured as the result of an introduction of an antigen (typhoid bacilli or red corupscles), hence are specific. The serum from the typhoid guinea-pig will not dissolve the erythrocytes nor will the serum from the immunized animal with red cells disintegrate the bacillus typhosus. Bordet and Gengou took advantage of the above facts to determine the nature of an infection by mixing the inactivated serum obtained from an animal suffering from some bacterial disease, with the bacteria (antigen) producing the affection and then added complement (guinea-pig serum). The above mixture is allowed to stand for about three-quarters of an hour and then red blood corpuscles plus its hemolytic amboceptor or antibody are added. If no hemolysis occurs it is due to the fact that there has already been a binding of the complement, the antigen and bacterial amboceptor being homologous. Hemolysis would take place in case the serum contained no amboceptor against the bacterial emulsion, thus rendering the complement available for the hemolytic amboceptor. It is quite evident from the above reactions that it is possible to demonstrate not only antibodies in the serum containing them, but also the substance (antigen) that give rise to their formation.

Wassermann, Neisser and Bruck[3] applied the above principle to the demonstration of antibodies in the serum of persons suffering from syphilis. They employed for their antigen an alcoholic extract of syphilitic organs obtained from a luetic still-born. Marie and Levadite found that a similar reaction, though a weaker one, could be produced with extracts from normal liver. Later, Michaelis, Fleischmann, Weil, Plant, Volk and others showed that antigens for syphilitic sera were found in nonluetic organs. Landsteiner, Muller and Potzl[4] used extracts of guinea-pig heart as antigen, and found that their positive results coincided with the congenital lueitic liver extract. This discovery is of great practical importance, as it will prove of inestimable advantage in promoting the availability of the Wassermann reaction because the guinea-pig's heart can be secured with great readiness, while the congenital luetic organs are, at times, quite difficult to procure. Wassermann conceived the idea that these substances must be very similar to the lipoid bodies because of the solubility in alcohol of the active constituent from various organs. He directed Porges and Meier[5] to experiment with lecithin and, in fact, found that the complement was anchored with syphilitic sera. Landsteiner and Muller discovered independently that lipoid substances, especially lechithin produced this reaction. Potze, Sachs and Altmann found that sodium oleate solution also acted similarly. Other substances such as cholesterin, glycogen, sodium glycocholate, and taurocholate, etc., were likewise found to react. Though Wassermann regarded this reaction at first as denoting the presence of antibodies in syphilitics and of antigens in luetic organ-extract, neither he nor his pupils, in their later communications, regard it in the sense of a recuperative reaction. Michaelis is of the opinion that the Wassermann reaction does not reveal the presence of antibody against the cause of syphilis or its poisons, but some other substances which has no direct connection with the cause of syphilis, but which is found more abundantly in, or more easily from, syphilitic organs than from normal ones. It is readily apparent that the lipoid element in this reaction does not depreciate its value, on the contrary it may explain the lipoid degeneration in parasyphilitic diseases. The diagnostic value of the reaction in many thousand cases examined by the best authorities surely establishes it of distinct value despite laboratory criticisms concerning its actual scientific foundation. In performing my tests I have employed only a few times the lipoid bodies as lechithin, choles-

tern, etc., preferring to use guinea-pig heart extract in the reaction with luetic sera.

*The substances employed in the Wassermann reaction briefly stated are as follows: 1. *Blood serum of suspected luetic* (inactivated). 2. *Organ extract* (luetic liver or guinea-pig heart macerated, extracted with alcohol and inactivated. 3. *Complement* (guinea-pig serum, not inactivated). 4. *Washed sheep's blood coruuscles.* Sheep's blood defibrinated and washed with normal salt solution about three times, and, finally, put up in 5 per cent and 50 per cent strength with normal salt solution, used for dilution. 5. *Hemolytic serum* obtained by injecting a 5 per cent sheep's blood corpuscles into a rabbit every eight or ten days, for about four or five times. About ten days after the last injection, remove blood from heart and collect serum and inactivate.

It is absolutely imperative that before the actual performance of the reaction, that all material to be used should be tested by viz: (1) To standardize the amboceptor, (2) to see that extract does not alone anchor the complement or the sheep's corpuscles be hemolyzed, (3) to see that the complement is active.

In every test it is necessary to employ a few known syphilitics and as many normal which serve as controls for the suspected area. Sometimes uncertainties arise in determining the result of the reaction, but in practically every instance it is traceable to failures of sufficient controls and the proper use of materials. In doubtful reactions a second or third test should be estimated with careful controls and using different antigens. It is unnecessary to explain in detail the entire reaction, especially since there have been so many excellent articles of late written on the subject. In carrying out this reaction, as it should be conducted, unfortunately is attended with difficulties which may discourage many who undertake it. There is no question but that a codification of the method that will furnish us an easy and accurate diagnosis is very much to be sought for. Many investigators have attempted to simplify the method, but thus far no great step has been succesfully accomplished towards this end until quite recently.

Noguchi describes a simplification of this test so sweeping that it practically eliminates all the technical difficulties, and places it within the reach of any well-trained clinician. He states that the principle of his new method is based upon the same principle as Wassermann's ,and utilizes the Bordet-Gengou phenomenon of complement-fixation to determine the presence of syphilitic antibody in a given specimen of blood serum or cerebrospinal fluid. It is quite different from the Wassermann method in that an anti-human hemolytic system instead of an anti-sheep hemolytic system is used. The original Wassermann method is subject to an error arising from a varying amount of natural amboceptor found in human serum, which is capable of being reactivated by guinea-pig's complement. The Noguchi modification eliminates this source of error, since it enables one to detect the presence of even a fractional part of one unit of syphilitic antibody in a given specimen. There are two different ways of applying the test: "In one the agents are employed in liquid form, and in the other they are used in a dried state on filter paper, when in solution, with (1) anti-human hemolytic amboceptor; (2) the guinea-pig complement; (3) antigen (organ extract). The papers are dried and standardized.

For further details see Noguchi's original article. I have employed this method, liquid form, using as far as possible the identical technique as given by the author in his original article. From the little experience that I have had with the test I can in the main confirm the author's contentions with reference to simplicity as well as to the delicacy of the

*A more detailed account of the technique of the reaction will be found in a most excellent article by Dr. W. J. Butler in the J. A. M. A., September 5, 1908.

test as compared with the original Wassermann. Further observations of the Noguchi modification are necessary. The bulk of my work has been with the original Wassermann, and I shall continue to use same for the present at least. The following are some of my results employing the original Wassermann test: Seventy-two cases were examined in which syphilis could be reasonably excluded. All gave negative reactions save two cases of pellagra and a case suffering from hydrophobia. In six cases of tabes, four were positive and two negative. Ten cases were tested in which they had contracted syphilis more than twenty years ago. Six gave positive results, two were doubtful and two negative. In seven cases of primary syphilis the reaction was positive in every case before the secondaries appeared (in five of these the spirochoeta pallida were demonstrated in the chancres). *Mercurial administration.* I have made a few observations relative to the mode of administration of the mercury, using the Wassermann test as a guide to proper assimilation of the drug. It is a well-known fact that active mercurial treatment will, in the great majority of cases, cause either a partial or total disappearance of the reaction. Two cases coming under my observation which have been studied in detail will illustrate the importance of the reaction relative to proper assimilation.

Case 1.—A negro man, age 25, strong and robust, noticed chancre on penis three days before I saw him. The spirochoeta pallida were found on first examination. The Wassermann reaction at that time was negative, but ten days later proved to be distinctly positive. Mercurial inunctions were given regularly. At the end of one week the Wassermann reaction still showed strongly positive. No appreciable effect in the reaction was discernable by the second week of mercurialization. But by the third week a decided change was noticed, and at the end of the fourth week total disappearance of the reaction resulted. Mercury was entirely withdrawn from the case with a view of ascertaining how soon the reaction would reappear. The test was made every four days. On the sixteenth day a partial test was obtained, and by the twenty-eighth day the test was practically restored to its former state. Mercurial inunctions were again given, and in three weeks the Wassermann reaction disappeared in five weeks. Instead of giving the patient the inunctions, I endeavored to ascertain what difference if any that would be produced in the Wassermann reaction as a result of administering the mercury per orem. The bin-iodide of mercury pills were used with the result that it required five weeks in order to obliterate the Wassermann reaction. A possible reason for the delayed disappearance of the reaction as compared with the inunction method lies in the fact that the mercury was not properly assimilated. The pills were withdrawn and in five weeks the reaction came back. Inunctions were then given the patient and in less than three weeks the Wassermann reaction was negative. ffl ffl

Case 2.—A negro male, age 32, with chancre on penis for ten days. The spirochoeta pallida were found in the sore in great numbers on first examination. The Wassermann reaction proved to be positive on the intial trial. Instead of giving mercury by inunctions, I decided to find out how rapidly it would take for the reaction to disappear by the hypodermic injection of mercury, using the grey oil. The reaction was made every four days. On the twentieth day a decided change was noticed. Four days later a total disappearance of the reaction was recorded. The injections were stopped and in three weeks the reaction was positive. The grey oil injections were again given, which resulted in the disappearance of the reaction in seventeen days. A withdrawal of the injections caused the reaction to appear in thirty days. The bin-iodide of mercury pills were then given with the result that it required six weeks to obliterate the Wassermann reaction.

From these two cases it would seem to indicate that the giving of mercury by the inunction and injection methods are far better than by administering it per orem, in the form of bin-iodide pills. I am not prepared as yet to state from experiments whether the injection method has an advantage over that of the inunction. I have at present two cases in which I am testing with the Wassermann reaction; alternating the injection method and the inunction method for the purpose of ascertaining their relative merits. Quite a number of cases should be tested by the above process and other ways before we can arrive at definite conclusions. It seems to me by such a method as the Wassermann reaction enabling one ot detect how much mercury a given patient can tolerate without giving enormous doses as well as ascertaining whether the mercury is being assimilated—if proved to be absolutely trustworthy—will be of incalculable value in the treatment of syphilis in all of its phases.

The Wassermann sero-diagnosis of syphilis is now on a thoroughly sound footing. More than fifteen thousand tests have been made by more than one hundred careful scientists. and all agree as to its inestimable merit. It is being used in Germany as a routine procedure in the examination of life insurance. Its adoption in the different hospitals and medical institutions should be no longer optional but absolutely necessary.

CONCLUSIONS.

1. The reaction is of value in all cases in which an ulcer has been present on the genitalia, the nature of which is not clear.

2. The diagnosis can be cleared up in those unfortunate individuals who go through years of their lives never knowing whether they have or have not contracted this dread disease.

3. By such a method of diagnosis the great sociological question concerning the marriage of syphilitic patients, the detection of syphilis in wet nurses, etc., is of incalculable value.

4. It is of inestimable merit in the differential diagnosis in every department of medicine.

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TREATMENT OF TUBERCULAR PERITONITIS

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Before it is possible to enter upon a rational discussion of the treatment of tuberculous peritonitis, it is necessary to recall the fundamental etiological and pathological facts, as well as the classification of the various manifestations of the disease. Direct infection of the peritoneum does not occur. Usually there is a primary focus from which the infection is carried to the peritoneum. Occasionally there is a hematogenous infection, in which case there would certainly be some other structure than the peritoneum attacked either previously or synchronously; and rarely, it is thought, the infection may be transmitted to the cavity without affecting the structure through which it comes. In general, it is claimed the routes are from a hollow viscus to the peritoneal cavity. In males this usually occurs from the intestine or the appendix, the latter usually; in females via the Fallopian tubes, although in women infection from the gut does occur doubtless with great frequency. In a paper read before the sixth International Congress on tuberculosis Altschul attacks the claim that tuberculous peritonitis comes usually from the tubes or the alimentary tract. He shows that infection of the tube may be sequent upon peritoneal infection. The difference in frequency between tuberculosis of the peritoneum in men and women is slight, if there be indeed any. The intestine shows no lesion in many cases and must be excluded as an etiological factor in these. The general circulation cannot be the cause, because there are many cases which show no pulmnoary involvement. The usual absence of peritoneal lesions in miliary are confirmatory. "The peribronchial lymph-glands suggest themselves as the sources of the infection, which may spread either by the blood or by the lymph-channels." (Altschul.) "The path of infection is, therefore," he concludes, "from the peribronchial lymph-glands through the perforating lymphatics of the diaphragm into the peritoneal cavity, chiefly to the retroperitoneal glands, which are almost always involved in tuberculous peritonitis."

The varieties are largely a matter of degree. The exudative, miliary, serous type is in most cases the incipient stage, although the amount of exudate and the future course may vary widely. Perhaps it would be wiser to say that pathologically the serous is the simpler type. In it there is less destruction of peritoneum and of viscera. In the ulcerative type there is greater involvement in depth, tissues subjacent to the peritoneum being involved and often organs destroyed in their entirety. The process is perhaps not so uniformly distributed over the lining of the cavity, but far more seriously affects the tissues attacked. The adhesive type is obliterative in its nature, and when finished destroys the peritoneal cavity. These, as stated above, may so imperceptibly shade into each other that the classification must be taken as typical and conventional. Let us, to make any nosological obscurity clear, take for example an infection inside the cavity. Tubercles will form at the site of lodgment of the germs and a serous exudate occur. Suppose that at given points they attack also the tissues lying underneath, converting them into caseous masses, the nodular type is established. Again, suppose that by destruction of endothelium they cause adhesions of contiguous surfaces, the fibrind-plastic variety is present. One can easily see how these may all occur in the same abdomen at

the same time, whatever the tendency may be toward a simple type in a given case. Before the accidental discovery that laparotomy could result in the cure, clinical at least, of tuberculous peritonitis, it was considered as being one of the most deadly afflictions, and was classed with sarcoma and cancer from its malignant nature. The accidental discovery of a single cure led to studied attempts with all sorts of treatment, drainage, mopping, irrigating, dusting, bactericides, exposure to sunlight, or atmospheric air. This finally settled down to a simple opening of the abdomen and closure without drainage. All admitted that there was no understanding how this procedure resulted in a reduction of the mortality from this dreadful disorder. There were numerous theories; there were then, there are now, no satisfactory facts to make it clear. Byford thinks that the value lies not in the surgical procedures, but in the preparatory and after-treatment, that, in fact, the same percentage of cures would result, without the operative mortality, were the same treatment given without abdominal section. Christian Fenger was of the opinion that the time had come for conservative treatment, and that there was no sense in operating on the adhesive types; that it did little good in the ulcerative (cheesy) type, and was followed by the best results in the exudative type, which offered, likewise, better prognosis than the others when not treated surgically. Borschgrevink's classical and much quoted words indicate his position in no questionable manner. He says that "surgery must hand back serous tuberculous peritonitis to the internal medicine clinic with thanks for the splendid opportunity which a misunderstanding gave the profession by means of laparotomy, to study tuberculosis in one of the large cavities of the body." I am quite sure that the advice is largely correct and likewise that the misunderstanding is largely, at least, cleared up, as I hope to show. With no possible explanation as to how the benefit was accomplished, with the knowledge these men had of the results of waiting, with the generally accepted teaching that only an incision was to be made and sutured up, leaving all diseased tissues *in situ* intact, and with the knowledge that the impatient surgeons were ready and anxious to hurl their reports into the literature before time enough had elapsed to determine end-results, I say in the face of all this, one need not wonder that thoughtful men like Fenger and Borschgrevink thought it time for surgery to cease its groping in the dark. Nobody questioned the immediate benefit. Nobody doubts that the neurotic is benefited by the rest in bed and the treatment incurred in laparotomy, but wait. Second operation has shown anotomical cures in some, others have "improved" on operation, and a second operation shows uninterrupted progress of the disease. Von Winckel found 71 per cent of 287 cases cured, apparently by operation. This gradually fell to 25 per cent by the end of five years, a questionable improvement over medical statistics.

There has been to me an incomprehensible something in the benefit to be derived by simply opening the abdomen and closing again. They were benefited, dismissed from the hospital as improved or cured, then reported, and forgotten. What has since become of them? Did surgery actually render a service of more than pathological interest? It is doubtful, except that out of all should come the true light. This was revealed when Dr. Murphy practiced and taught that the primary infection, accessible through the abdomen in the vast majority, should be dealt with and thus the feeder of tubercle bacilli into the peritoneal cavity removed. This was a rational, surgical step, and placed tuberculous peritonitis legitimately in the domain of surgery. Borschgrevink's "misunderstanding" was elucidated when it became known that in men the most ferquent source of infection was the right iliac fossa, hence an incision in these over the appendix, and in women that it usually came from the pelvis, hence in them a median incision. We realize that we do something of value when

we take away not only a diseased but a disease-distributing organ. The sooner we remove it the less it will distribute, and another urgent step ahead is the early recognition of these cases. In obscure and slight pelvic and right iliac disturbance in themselves insufficient to warrant a diagnosis or an operation the tuberculin tests should be resorted to with increasing frequency until the surgeon escapes the mortification of having to serve as a helper in a helpless cause. Those cases of the ulcerative or adhesive type are not to be benefited much by surgical procdures. They are the worst the surgeon can hope to deal with. Carl Beck has said that there are two classes of peritoneal tuberculosis, one easily diagnosed, the other extremely difficult. The former are they in which "operative treatment, as a rule, has proved without avail." While in those accidentally discovered, as when operating for something else, the results were splendid. This can only mean that recognized early and operated on early means a good prognosis.

There is no question that the exudative type offers the best prognosis to surgical as well as to medical treatment, and that the caseous and adhesive types, as types, offer little to be gained by such interference, if indeed anything at all. I think it would be better perhaps to say that where the peritoneum is destroyed and no cavity longer exists, also where caseous masses have already occupied the cavity and the gut is so diseased that the slightest interference, not to mention the removal of the tissues, may terminate in death or an incurable fistula, surgery offers nothing, and in cases where it may safely remove diseased tissues, it offers much.

This paper was written to call attention especially to the time prior to the development of peritonitis and to that subsequent to operation. In obscure conditions of the pelvis and right iliac fossa of mild grade, sufficient however to annoy the patient, when no physical signs or symptoms are present sufficiently to clear up the etiology, the diagnosis should not be ventured and the treatment should not be begun until tuberculin has been used to eliminate the possibility of tuberculosis. If it proves positive, that even then does not mean that the tubercular process is acting at one of the two sites named, although a physical examination would enable one to determine with satisfaction on this point by the exclusion of others. By this means the process may be dealt with much earlier in the average and the results much more satisfactory. My results have been most gratifying in the accidentally discovered cases, and in those where an early operation was done on suspicion of tuberculosis. Many of the late cases, almost all of them, would, while I have had no operative mortality, have been as well or better left unoperated.

Attention is now directed to the second fact. Surgery is usually accepted by the laity, too often by physicians, as the ultimate resort, which, if it do not terminate in operative death, will surely give complete relief. This is largely true in general work, thanks to our ability to take away the offending structure or so to deal with it as to allow nature to assume control. Not so in tuberculous peritonitis. We may excise the primary focus, we dare not to attempt eradication of the infection from the whole cavity. When this primary focus is withdrawn, the individual is not cured, he is only placed where the cure may occur. A part only of the burden has been removed from the task of nature, and by her usual means she must eradicate the remaining lesions from the peritoneum and elsewhere. The patient and the physician should understand that the cure is only begun when the former is able to be discharged from the hospital, and that the closest attention must be given to a strict regime of treatment for years. One can certainly not accept a clinical cure in the light of common facts, but must persist in making certain that a silent vulture is not painlessly eating away the very vitals of existence. The patient is improved, is symptomless, and yet may not be cured. Of

this after-treatment too much cannot be said for the scientific use of tuberculin. I say scientific use advisedly, for no therapeutic agent is capable of such trickery in unskilled hands, a trickery that has deprived it of twenty years of useful service.

So tuberculous peritonitis is handed to the surgeon by the physician today with perfect understanding, and then handed back to the physician, benefited in most cases, cured at the time in but few, for the physician to take up his work after the surgeon has removed insurmountable obstacles. It is surgical only for a time, it is always medical. If the origin is obscure, laparotomy may be done to determine whether the original lesion may be located and dealt with; in case it cannot be found, or being found cannot be removed, the patient will then derive whatever of benefit simple incision and closure may offer *per se.* but this must not be considered final. We must cease to delude ourselves and our patients into believing that it is.

GONORRHOEA AND THE PUBLIC HEALTH

By THOMPSON FRAZER, M.S., M.D., Asheville, N. C.

I make no claim for originality for this paper; it is largely a compilation, and, necessarily by the nature of the subject, somewhat statistical. This, by way of anticipation of those, lest (having read it) they excliam: Redolet lucerna.

In 1891, when Dr. Valentine attempted to speak of venereal diseases at one of the meetings of the New York Medical Society, some one made an objection, claiming that the subject was not fit for discussing; the objection was sustained. This is not the attitude of the medical profession today; whatever affects the public health is properly regarded as of the greatest importance. My apology is that few of us, even amon gteh profession, realize the enormous prevalence of gonorrhoea and the great number and severity of the injuries it leaves in its wake; while the lay public, in whom the matter of control must be largely invested, regards gonorrhoea as being about equal in severity with a bad "cold."

ETIOLOGY OF GONORRHOEA.

The exciting cause is, of course, the coccus discovered by Neisser pust thirty years ago; equally important is the predisposing cause, the sexual instinct, and the result of that instinct, prostitution.

This history of prostitution is the history of the human race, for irregular intercourse has always existed. In Biblical times harlots abounded and concubinage was a recognized and much-prized institution; Acient Greece had several grades and varieties of prostitutes; Rome had her "women of the green toga"; the Crusaders, going to their "holy war," took their lewd women with them.

Today the existence, in Europe, of the "mistress," and in America of the "kept woman," as well as the ubiquity of public brothels and of clandestine prostitution, show that conditions are essentially the same as they were many thousands of years ago. Nor is the reason for this far to seek: the sexual instinct is one of the strongest instincts we passess; moreover, the age at which it manifects itself is much earlier than is usually thought. Boys have it before the age of fourteen—generally taken as the age of puberty—and jacobi claims that erections begin at seven years of age. While the desire is incomplete at this early age, there is a long period between puberty and the age of legal manhood—the period of adolescence—during which the sexual desire may be said to be at its apogee. Arrived at the age of twenty-one, with the duties and privileges of a man, there is another long period during which the majority of men are unable to legally satisfy their natural instincts. The advice contained in the oft-quoted remark of St. Paul, "It is better to marry than to burn," cannot be followed, for under present social and economic conditions few are able at this time of life to marry and support a wife. In what way, then, shall they satisfy their desires, or is it even necessary that they do so?

I think it is universally accepted that intercourse is not necessary to the welfare of man, that continence is not harmful and may be beneficial. There are men who never had intercourse before their marriage, this sometimes taking place late in life; these men, thought exceptional, do exist. Nocturnal emissions—nature's safety-valve—come to the rescue. There are others, however, wrongly

considered continent; such are the boys in preparatory schools and colleges, who, though abstaning from intercourse from moral reasons o rthrough fear of infection, resort to the practice of masturbation to gratify their passion.

The conditions, then, are these. Given a strong sexual instinct, and without legal means of satisfying it, there will continue to be a supply as long as there is a demand. The ideal means of solving the problem, by the practice of continence, will appeal to but few; the large majority will still seek their gratification in coitus. The saying that "a young man must sow his wild oats" illustrates public opinion on this topic, and the brothel, sanctioned by society, continues to exist. It is into this place that the young man finds his way; alone, perhaps, and with fear and trembling lest he be recognized, or lest he acquire some venereal disease. On this score he has little fear; he has had the place recommended to him as a "first-class house," and as yet has no idea of the prevalence of disease. Or, he may go with several boon companions—after a convivial evening—not knowing, not caring, to what he exposes himself.

Another possibility is open to the youth. Instead of resorting to the public streetwalker he may have connection with a clandestine prostitute (such as a servant girl or shop girl), thinking it safer. Very frequently this sort of woman, not possessing the rudimentary knowledge concerning cleanliness and infection which the inmates of the brothel have, proves to be a greater source of danger than the former. Fourier considers these women "beyond the reach of the law," as he terms them, as being responsible for more infection than the out-and-out professionals. These free-lances of prostitution are estimated as constituting one-half the total number, hence their importance. If, however, many stenographers, chorus girls and factory girls, as well as many of the inmates of massage and manicure parlors, were included, the number would probably found to be greater than of those living in the "maisons de joie."

It is thought that every prostitute becomes infected with venereal disease during her career. As this is a short one—Sanger in his "History of Prostitution" claiming that four years is the average duration of life after entering the ranks—it shows what enormous risks a man takes when patronizing the prostitute. So much for the etiology, now as to the

PREVALENCE OF GONORRHOEA.

While syphilis is more universally dreaded, gonorrhoea is, from a social point of view, a far greater danger, both by reason of its greater frequency, exceeding that of syphilis many times, and on account of its long duration, the uncertainty of cure, and the great suffering it entails. The estimate generally given as to the proportion of males who acquire syphilis is 10 per cent. This refers to males living in cities and includes all sources; hospital statistics would run a little higher.

When we come to gonorrhoea we find the percentaeg much higher. Lesser, Ricord and others estimate that 80 per cent of males in towns have had gonorrhoea; others go as far as to claim that 95 per cent have been infected. These are taken from hospital statistics and are probably too high. Neisser's opinion is best expressed by the name he has given gonorrhoea—"the second most common acute infectious disease"—measles, being, of course, the first.

Erb's figures, published in the "Muenchner Medicinishe Wochenschrift," are more moderate. His estimate is 45-50 per cent, most of them acquired before the age of twenty-five. It is possible that these figures are too low as they were gotten in the following manner: Erb questioned several hundred men, many of them middle-aged, as to whether they ever had gonorrhoea, and, if so, at what age. It is possible that some might have refused to admit having had it. Whatever the exact per-

centage may be, the important fact is that gonorrhoea is very common.

COURSE OF THE DISEASE.

The symptoms are familiar to all. The course of the disease is about as follows: The youth with his first "dose"—as he jocularly refes to it—may consult a doctor or he may be prescribed for by a drug clerk or a quack; in any case he is soon obliged to discontinue treatment on account of the expense involved. The acute stage passes, the "morning drop" still persisting; after a few weeks this disappears, but a thin discharge continues. This chronic condition—gleet—may last weeks or months, when the discharge may entirely disappear and the patient believe himself cured.

COMPLICATIONS.

Complications that frequently occur are cystitis and prostatitis. Epididymitis is not uncommon; structure is almost always of gonorrhaeal origin. "Surgical kidney" is an occasional end-product; the joints and serous membranes are sometimes affected; rarely endocarditis or gonorrhoeal septicaemia develops. Taken as a whole, however, it cannot be said that the usual complications and sequelae are very serious—for the man.

RESULTS OF GONORRHOEA—TO WOMEN.

The effects on women are of a much more serious nature. Little does the young man, infected at an early age, realize that the gonococcus may hibernate for an almost indefinite period in the crypts of his urethra, and that years later, it may, as the "nuptial microbe," bring sorrow and suffering upon her he has promised to protect. The fact that venereal diseases work their havoc in the dark, so to speak; that they are private diseases and that statistics are not readily available, blinds our eyes to the amount of misery they entail.

From different sources I have gleaned the following: Sixty to 75 per cent of the operations of gynecologists are made necessary by the gonococcus.

Price, of Philadelphia, says that 95 per cent of all abdominal operations on women are due to gonorrhoea; 80 per cent of the deaths from diseases of the uterus and ovaries are attributable t gonorrhoea.

An epidemic of cholera or typhoid appeals to our humanitarian instincts because of the great number of lives lost; we forget that venereal diseases are pandemic and that, although the death rate from them is appalling, it represents but a small fraction of the total amount of suffering.

Prince Morrow says that 70 per cent of the women who come to the New York Hospital for treatment of uterine diseases are respectable married women infected by their husbands. This, of course, would be difficult to prove.

Noeggerath years ago made the estimate that 30 per cent of married women are infected by an old gonorrhoea of the husband. It would seem (on reading up the literature on the subject) that most writers have simply copied Noeggerath's figures so often does this asme percentage occur in different articles on the subject.

It is refreshing to turn from these figures to those of Erb, in whose series of several hundreds of cases, only 4 per cent of women were shown to have been infected by their husbands. The exact proportion must always be a matter of conjecture.

Closely allied with gonorrhoea's effect on the female generative apparatus is its

INFLUENCE AS A "DEPOPULATOR."

Many writers thin kthat gonorrhoea is as potent a cause of abortions as syphilis.

A salpingitis (and this is often due to gonorrhoea) is thought to be the most common cause of ectopic pregnancy.

Gonorrhoea is regarded by some as being responsible for a great number of sterile marriages—Neisser placing the percentage as high as 50.

It is thought to be a factor in causing the

so-called "one-child sterility"; the infection traveling rapidly upwards after the birth of the first child and instituting inflammatory changes in the endometrium, which frequently preclude chances of further pregnancy. Erb rather ridicules this idea; he believes that gonorrhoea in the male is more quickly cured than most writers seem to think, and that, therefore, the danger to the wife has been overestimated. Of several hundred cases of his of acknowledged gonorrhoea before marriage, over two-thirds of these had two or more children, otehrs had four or more, and only a small percentage of these unions were childless. He thinks that sterility is usually "premeditated;" in other words, he attributes it to deliberate race-suicide."

Another possible cause of sterility is a bilateral epididymitis.

GONORRHOEA AS A CAUSE OF BLINDNESS.

Of about sixty thousand blind persons in the United States, from fifteen to twenty thousand are so as the result of a gonorrhoeal inflammation of the eyes acquired at birth.

With the treatmentof gonorrhoea I shall not deal, but shall pass on to

PROPHYLAXIS.

Results can be expected only through education and legislation. The first step should be the education of the public. This should be undertaken by physicians, and would be most easily accomplished by means of pamphlets and illustrated lectures on the subject, these to be supplemented by more intimate talks. The state authorities should taek up the matter, as they have done with tuberculosis.

As recently as 1899, when Denslow Lewis, now Chairman of the Committee on Hygiene of the American Medical Association, was invited to speak on the subject, Howard Kelly, who was present, said, "The discussion is attended with filth, and we besmirch ourselves by discussing it in public." As long as this attitude toward venereal disease prevails there will be little progress made.

There must be free discussion of the subject; the fathers and mothers should be made to realize the dangers that heir daughters run in getting married, and in time a clean bill of health will be required from the bridegroom-elect, as is the case in some of the states now. Public opinion should be aroused by the fact that the greatest sufferers are women and children.

A curious condition confronts us. As some one has said, "It is a greater crime publicly to speak of venereal diseases than privately to contract them." We regard any mention of sexual matters as indelicate, we resent their discussion in the public press, yet our newspapers, which are read by both our sons and daughters, teem with the filthiest advertisements.

We protect our children from small-pox and diphtheria; why subject them to the risk of much greater suffering? It has been truly said that we select the mates for our dogs, our horses, our cattle, with far greater care than we do those for our daughters.

Again, the idea that "innocence (or ignorance) is its own sweet protection" is not founded on fact; our daughters should be instructed at a much earlier age on the subject of sexual relations; a false sense of prudishness should not prevent us from saving them from a life of disease and misery.

It is a strange irony of fate that the sexual act, which is of little pleasure to woman, entering into it as she does out of compliance with her husband's wishes or through the desire for children, should be so frequently fraught with great danger for her. In an article by Dr. Albert H. Burr, of Chicago, entitled "The Guarantee of Safety in the Marriage Contract," i sthe following:

"By the right of might, not always free from injustice and tyranny, man has constituted himself woman's physical guardian; her safety in the marriage contract, which binds

them both in a common destiny, should be his most sacred care."

EDUCATION OF THE BOY.

The young man should receive sexual instruction early in life; continence should be enjoined, and he should be taught the value of active exercise in the open air in combating the sexual desire; also that abstinence from stimulants will make the victory easier. He should not be intimidated, however, and should he make a slip, he is but obeying a primitive instinct; should he acquire a venereal disease, he should be thought of as more unfortunate than sinning. Ellis, of London, says: "The man who is run over in crossing the street, the family poisoned by unwholesome fod, the mother who catches the disease of the child she is nursing, all these suffer as the result of gratifying some fundamental human instinct, the instinct of activity, the instinct of hunger, the instinct of affecion. The instinct of sex is as fundamental as any of these, and the evils which follow the act of gratifying it stand on exactly the same level. This is essential and fundamental fact; a human being in following the human instincts implanted within him has stumbled and fallen."

Whether our sympathy is enlisted in his favor to this extent, or not, once infected, the youth becomes a source of danger to others and the fact that he considers gonorrhoea a disgraceful disease is one reason why he seeks a quack rather than the family physician.

Instructive pamphlets dealing with the matter in detail should be given to the boys in colleges and schools. In many of the schools of Germany the students on matriculation are given a leaflet containing the necessary information as to the nature of venereal diseases, their symptoms, course and remote dangers. The ethical responsibility of those who wittingly infect others is also dealt with. The German Society for the Prevention of Venereal Diseases has published a booklet, copies of which are distributed to physicians, officers of the army, dispensaries and sick lodges. This society has succeeded in overcoming the discrimination which was formerly practiced by these lodges against gonorrhoea; now, those suffering with it are just as much entitled to assistance as if they had contracted any other disease; in former days gonorrhoea was not considered a legitimate disease and the sufferer therefrom frequently did not receive proper treatment.

In other countries the awakening has also come; in Paris, an active campaign, started by Fournier, has been instituted, there has even been put on the stage a drama entitled "Les Avaries" (The Tainted), dealing with venereal diseases.

In America we have been somewhat slower in taking up the matter. Our Puritanism bids us conceal that which we do not approve; ten years ago we heard little of "dishonesty" or "graft," the words "business" and "politics" explaining everything, even now a man dying of tuberculosis is often referred to by the euphonism, "delicate." With the advent of the muck-raker our ideas on these subjects have changed; we have learned that to disregard the existence of certain evils is not to cure them; we have realized the truth of the old Latin adage, "Alitur vitium vivatque tegendo" (vice lives and thrives by concealment).

Pamphlets dealing with the matter have recently been published and distributed by the Committee on Social Betterment, by the Chicago Society of Social Hygiene, and by many of the state authorities.

Some magazines are beginning to show signs of having a conscience by refusing to accept venereal advertisements. Until the newspapers, however, are prohibited from publishing them we cannot expect a better treatment of gonorrhoea, as they are the mainstay of the quacks.

A few states have enacted laws aimed to protect women from their husband's venereal disease. In Indiana the defect of the law is

that it does not require a medical examination but accepts the sworn statement of the applicant for a license that he is free from venereal disease. North Dakota requires a certificaet of health signed by three doctors appointed by the county judge; Michigan has a similar law. In time it is to be hoped that all states will pass suitable laws; until then those having suffered with gonorrhoea or other private disease should be impressed with the necessity of abstaining from marrying or having intercourse until pronounced cured by a competent physician.

What constitute sa cure? It is not enough that a man should have no "issue of the flesh," as it was in Biblical days; the urine, when examined, should contain no shreds, or, if present, they should be few in number and free from gonococci. The method suggested by Dr. Valentine is as follows: After irritation of the urethra by drinking alcohol, by passing sounds and by the use of strong injections, any discharge developing should be of a temporary nature and free from gonococci. Massage of the prostate and examination of the expressed fluid should be done. If this method be pursued and repeated at an interval of several months and still no gonococci are found, the urethra and adjacent parts are presumably sterile and marriage may be allowed.

There is one thing we have not considered; something of prime importance when dealing with infectious diseases, and that is the source of supply: the infected area. Ignoring man's instincts, society makes no attempt to protect him, but says, "If you expose yourself, you must take the consequences." The practical certainty that they will be infected seems to have no deterrent on most men.

Again, there is a large element that thinks by regulating and licensing the prostitute and charging a small fee therefore, the government shares the profits of vice. They fail to realize that that is just what the government is doing now, tacitly allowing prostitution and collecting revenue every so often by arresting the women on the charge of "vagrancy" or of "keeping a disorderly house." The difference is, that by the latter method, that of toleration, there is no protection afforded, whereas by regulation some degree might be attained. It would perhaps be wiser to charge the expense of licensing to the general public rather than to the prostitutes; this would remove much antagonism to regulation.

Let us see what regulation has done. Statistics, though notroiously unreliable, are all we have to base our deductions on.

The figures of the British army show that the admission rate for venereal diseases, where prostitution is unrestricted, is more than double that where regulation and sanitary control are exercised. The same thing was shown at the barracks in Metz, Germany; as soon as the women on the town were obliged to present medical certificates the amount of venereal disease decreased one-half.

The examinations to be effective must be thorough and must be frequent; if necessary smears of the vaginal secretion must be made daily as is advocated in France. It has been argued that smears frequently fail to show gonococci, and yet the women from whom they were taken may prove infectious. The explanation of this is that the gonococci are deep in the ducts of the mucous glands, but are expressed with the secretion during sexual excitement. Despite the fact that a negative report is not a guarantee of innocuousness it has been shown that repeated and careful examinations will partially protect.

Isolation of the diseased should be practiced. The keeper of the house should be compelled to furnish the inmates appropriate treatment and to see to it that they refrain from following their calling until a cure is established. Dispensary treatment is unsatisfactory, because the actions of the patients cannot be controlled, therefore special hospitals should be established where those suffering from private diseases may be retained un-

til they cease to be a danger to society. Although the cost would be enormous, it has already been found practicable in some countries as the only method by fhich venereal diseases can be controlled. The great amount of suffering that could be obviated, of blindness that could be prevented, as well as the large number of surgical operations that would be made unnecessary by these means, would seem to justify any expenditure.

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INTESTINAL PARASITES AND THE DIAGNOSIS OF NEURASTHENIA

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Our standard text books fail to mention intestinal parasites as the cause of neurasthenia. Neither do they record any of the nervous or mental symptoms that accompany parasitic infection of the intestines.

Ordinarily it would be impossible to confuse the typical cases of uncinariasis or amebiasis with neurasthenia, whatever the nervous or mental symptoms might be, but there are many atypical cases of intestinal parasitism in which the picture is that habitually seen in chronic neurasthenia. For instance, no one would think of a history of ground itch, anemia, esinophilia, constipation with clay colored stools, and muscular weakness as meaning anything but uncinariasis; and in the same way chronic dysentery with anemia, with blood and mucus in the stools, and with painful defication, means amebiasis. But we see cases of uncinariasis in which there is no history of ground itch, with haemoglobin above 85, and with regular and normal bowel movements; likewise cases of amebiasis without marked anemia, giving a history of perfectly normal bowel movements or slight constipation for a number of years.

These cases are sent to our neurologists as chronic neurasthenics, after going the rounds in their home towns for from one to ten years. They complain of muscular weakness, headache, sleeplessness, depression, irritability, sometimes loss of weight; they tire out mentally very quickly, think and talk about nothing but themselves. They rarely give a voluntary history of indigestion; appetite good or variable. They are all habitual medicine takers and are particularly partial to large doses of calomel and quinine as remedies for "biliousness and a touch of malaria"—that grand old diagnosis that covers anything from gall stones to rheumatism.

Case 1.—A. B. C., white, male, age 30. Native of Florida. Family history negative. For ten years had had biliousness and coated tongue. Says he has been sallow for six years, though to all appearances he is not anemic. For last five years has been below his normal weight. Occasionally constipated, occasionally has diarrhoea. Takes his temperature twice daily and says it runs from 96 to 98.5 F. Six months ago had his appendix removed; his surgeon afterwards told him it was perfectly normal. Appetite variable; sleeps fairly well; easily fatigued mentally and physically; depressed; irritable. Thinks and talks a great deal about his health. Says he has taken medicine pretty steadily for ten years. Had ground itch when a boy.

May 14 case was referred to me for blood examination for malaria. Haemoglobin 90. No malarial organisms. Eosinophiles 10 per cent. Urine negative. Physical examination showed only exaggerated reflexes and some loss of weight. Feces showed a very few eggs of Necator Americanus.

May 16. Patient threw away his thermometer and took thymol grs. 30. Less than a dozen worms were seen.

May 19. Feces still showed eggs. Thymol, grs. 30. A few worms recovered.

July 20. Feces showed no eggs. Thymol, grs. 60. No worms recovered. Patient has gained seven pounds; still has coated tongue, but says he feels stronger and better than he has in years.

Case 2.—Mrs. C., white, female, age 34.

Wife of Presbyterian divine. Native of eastern North Carolina. On July 5 case was brought to me for a blood examination for the sake of the mental effect the procedure would have. Blood showed haemoglobin 65, eosinophiles 10 per cent. Inasmuch as the pateint looked anemic and gave a history of chronic constipation for which she took purgatives regularly, hook worm was suspected and a constipated stool was requested. In looking over a semi-solid stool next day for eggs, amebae and monads were seen. Patient was ordered to the hospital and put on routine dysentery treatment. After the initial dose of salts amebae and monads were plentiful in the stools.

She gave a history of malaria over twelve years ago followed by dysentery lasting six weeks. Married eleven years; four children and one miscarriage. Youngest child thirty-four months old. Slight perineal laceration at the birth of first child. Menses were irregular a year ago, but have been regular for the last eight months. Backache, headache and depression precede the menstrual flow. After birth of third child five years ago was weak for a long time and has been very nervous and anemic ever since. Appetite good; sleeps well; tires easily; complains of constipation and sick headache. Has never been strong during the last twelve years.

Physical examination negative; urine negative.

Case 3.—J. D. S., white, male, age 20. Native of Anderson County, S. C. (In the sand belt.) Farmer. Seen in consultation with Dr. S. M. Crowell, July 22. Case had been sent to him as a chronic neurasthenic with a tentative diagnosis of beginning of locomotor ataxia.

Family history showed a variety of nervous afflictions in the past three generations.

Past history: Ground itch off and on for the last ten years. For past six years has been treated for nervous indigestion. Had measles four months ago, followed by hoarseness and three weeks' diarrhoea. His indigestion and nervousness have become very much worse. Feels cold and numb. Thinks he is turning dark. Says feet feel like a fish. Has enormous appetite. When he goes to bed at night feels as though something was closing down on him. Says at night his eyes stare and jerk from side to side, etc. Talks in a loud voice. gets very confidenital, cries at times and is often depressed. Enjoys rehearsing his symptoms. Smokes cigarettes almost continuously.

Physical examination negative except that skin looks a muddy yellow: Blood: Haemoglobin 70, eosinophiles 6 per cent. Urine normal. Feces: Light yellow, pastey. Full of eggs of Necator Americanus.

July 23. Thymol, grs. 60 administered and 151 worms recovered.

Conclusions: Intestinal parasitism is a frequent cause of chronic neurasthenia and at times the pronounced nervous and mental symptoms entirely overshadow the vague symptoms of intestinal invasion. In view of the wide prevalence of intestinal parasites in the South, a haemoglobin estimation, a differential count for eosinophiles, and a microscopical examination of the feces are essential before a diagnosis of primary chronic neurasthenia is justified in this latitude.

THE OPSONIC INDEX

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There is present in the serum of blood substances which hold within themselves the power of preparing the various bacteria for inception by phagocytes. These substances are called Opsonins, from the Greek Opsono, I cook for table or I prepare pabulum for. Various other similar substances also float in the blood serum, namely: bacteriolysins, bacteriocidins, agglutins, antitoxins, etc. The phagocytic theories of immunity of the past did not give the blood serum any important part, but the following illustration will go to show that the blood plasma plays a most important part in phagocytosis. Taking separate preparations of the three essential elements of phagocytosis, namely, 1. An emulsion of the micro-organism under experiment; 2. Leukocytes washed free from plasma, and 3. A few drops of the blood serum of the patient under observation. First, if equal volumes of the free leukocytes and emulsion of bacteria are placed in a test tube and incubated at 36° C for fifteen minutes no phagocytic action has taken place. If, however, the experiment be repeated with the exception that in addition to the leukocytes and bacteria blood serum from some healthy individual be added, phagocytosis will occur. This concludes that the serum supplies a substance or substances necessary for phagocytosis to occur. These substances have been named opsonins and so called because they act by preparing the bacteria for reception by the leukocyte. It is well known that invasion of the human body by infective organisms induces a leukocytosis, and anything which increases the phagocytic power of these cells must be a prominent means of combating disease. That phagocytic power can be increased is easily demonstrable, and on the other hand is also an effective agent for diagnosis. This method of diagnosis is carried out without administration to the patient, thus avoiding any unpleasant endings as have occurred after repeated administrations of tuberculin to diagnose doubtful tuberculosis. These opsonins can be destroyed by heat at 60° C. for fifteen minutes. The relative amount of opsonins present in any individual for any particular micro-organism can be accurately determined by counting the number of bacteria ingested by a certain number of phagocytes when mixed with some patients' serum and comparing this number with the phagocytic count obtained by using the serum of some normal individual instead of one under experiment.

COMPILATION TO SHOW THAT PHAGOCYTOSIS DEPENDS UPON THE SERUM AND NOT UPON THE LEUKOCYTE.

1. Serum of normal individual plus T. B. suspension, plus leukocytes of normal individual equals 5.7 T. B. per leukocyte.
2. Serum of normal individual plus T. B. suspension plus leukocytes of lupus patient A equals 5.4. T. B. per leukocyte.
3. Serum of normal individual plus T. B. suspension plus leukocytes of lupus patient B equals 5.2 T. B. per leukocyte.
4. Serum of normal individual plus T. B. suspension plus leukocytes of lupus patient C equals 5.3 T. B. per leukocyte.
5. Serum of lupus patient A plus T. B. suspension plus lekocytes of normal individual equals 2.5 T. B. per leukocyte.
6. Serum of lupus patient B plus T. B. suspension plus leukocytes of normal individual equals 2.4 T. B. per leukocyte.
7. Serum of lupus patient C plus T. B. suspension plus leukocytes of normal individual equals 3.2 T. B. per leukocyte.

*Read at a regular meeting of the Manchester Medical Society.

As for example: Taking the opsonic content of a person's blood in relation to the tubercle bacillus. Two counts are necessary, one of a normal individual and one having tuberculosis. First count obtained from patient's serum plus plasma free leukocytes plus emulsion of T. B. incubated at 36° C. for fifteen minutes results in ingestion of three hundred T. B. by fifty leukocytes; thus the phagocytic count would be $\frac{300-6.}{50}$ Second count obtained from normal person's serum plus plasma free leukocytes plus emulsion of T. B., after exactly the same course as previous count, showed that two hundred T. B. had been taken in by fifty leukocytes, the count would be $\frac{200-4.}{50}$ The, "Opsonic Index," of the patient for tubercle bacilli is expressed by the ratio

$$\frac{\text{Patients phagocytic count}}{\text{Normal phagocytic count}} \quad \frac{6}{4} = 1.5$$

This same routine can be followed out practically and mathematically upon any micro-organism, and the result will be the opsonic index of the known individual for that special micro-organism desired. That phagocytosis does depend upon the blood serum and not upon leukocytes can easily be shown by taking leukocytes from a normal person, leukocytes from a patient with pulmonary tuberculosis, serum from a normal person, and serum from a patient with phthisis, and a suspension of T. B. First mix the serum of a normal person plus T. B. suspension plus leukocytes of a normal person and also in another tube put serum of a normal person plus T. B. suspension plus leukocytes from tubercular patient and beside of these results put the results of two mixtures the same as the previous ones except that normal leukocytes are used in both and the abnormal serum. To any mixture of normal serum and micro-organism suspension you may add leukocytes from either normal or pathological persons, yet no change takes place, but the moment that serum from a pathological person be added and the normal leukocytes left, a change is noted at once. When a person is inoculated with sterilized micro-organisms or vaccines this inoculation is soon followed by the further manufacture of opsonins within the blood of that person or, in other words, the *opsonic index* is raised. At once, after such an inoculation, there follows a temporary lowering of the opsonic index, this lowering having been called the *"Negative phase."* This *negative phase* is probably brought about by the vaccine entering into a destructive chemical combination with the opsonins already present in the blood. This so-called *negative phase* is followed, in from three to four days, by an increase in the opsonins and is called the *"positive phase."* This *positive phase* is caused by the cells of the organism being stimulated to activity, and the previously destroyed opsonins are replaced with interest. This increase continues for four to five days until a point is reached where the opsonic content of the blood remains stationary at a much higher level than at time of inoculation. This maintainance of high standard is called the, *"high tide of immunity,"* and lasts ten days to three weeks, or even sometimes for a month, when it gradually declines to the level at which it stood previous to the inoculation. This line of events will occur after inoculation from any bacterial vaccine. If a large dose of the vaccine be given the *negative phase* is more pronounced and may be accompanied by a temperature reaction and other systemic signs, but if a small dose be given, the *negative phase* is less marked and no other signs noted so far as temperature and constitutional disturbances are concerned. During the *positive phase,* during which the patient's antibacterial power is being raised, there may be experienced an increase of physical vigor and a marked feeling of well being. Now suppose that instead of one inoculation being made, a series of successive inoculations are made in close approximation, a cumulative effect is produced just as you would expect a cumulative effect in giving medicine of certain classes by mouth, in larger or smaller

doses and closely following each other. This cumulative effect of vaccines effects more particularly the negative phase. Therefore, if a second inoculation be made during the negative phase of the previous inoculation the opsonic index may be so markedly lowered as to result fatally. Thus can be accounted for the fatalities which have followed too large and oft-repeated doses of Koch's tuberculin and diphtheritic antitoxin. It is rather unfortunate that such a cumulative effect could not be noted in the positive phase, but it has not up to this date. The opsonic index should always be found immediately previous to an inoculation and clinical signs not

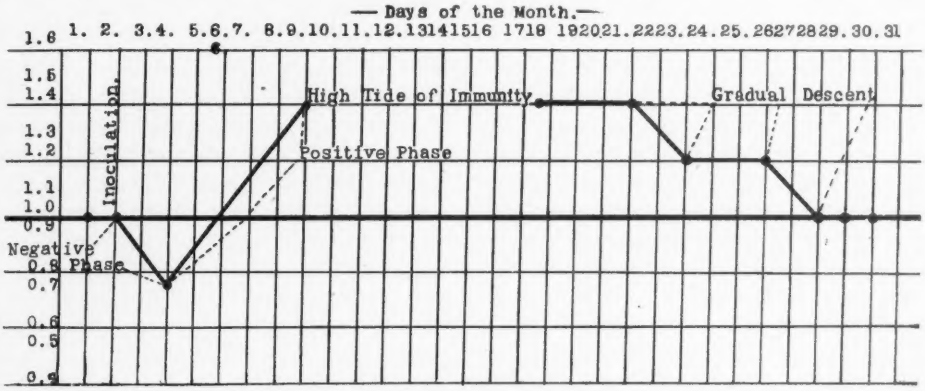


CHART SHOWING NEGATIVE AND POSITIVE PHASES, HIGH TIDE OF IMMUNITY AND GRADUAL DESCENT TO NORMAL OR BASE LINE.

depended upon to show presence of negative phase. If such symptoms are noted, the patient's resistance must necessarily be greatly lowered. Exact doses of the vaccine must be used and therefore a standard for each one is made. For instance; the dose of staphylococci is five hundred million to two thousand five hundred million microbes for each inoculation. The dose of tubercle bacilli varies from $\frac{1}{1000}$ M gram to $\frac{1}{600}$ M gram of tubercle powder. To show the opsonic index in health, the index for tubercle bacilli was figured out from forty-four medical students and forty hospital nurses and found to be .96 with variations in the whole of .8 as the minimum and a maximum of 1.2. In a healthy person the opsonic index does not vary from day to day. The opsonin is a comparatively stable substance in blood serum, and will not deteriorate for at least twelve hours after withdrawal from the body. The opsonic index in localized infections is generally lower than that found in health, giving perhaps an average of .62 in localized staphlococci lesions. In lupus more than three-fourths of the cases will be found to be below normal. In cases of tuberculous joints the index will be below normal. In arrested cases of pulmonary tuberculosis the index is also below normal. On the contrary, in systemic infections, the index is above normal or is a variable quantity. In cases of pyrexial phthisis, on some days it will be lower than .8 and on other days above 1.2, varying four or five decimal points from day to day, at times. Rest in bed has a tendency to lower the opsonic index while exercises will raise this same index produced by rest. The absence of a high or variable tuberculo-opsonic index in an acutely ill patient is quite strong evidence against the condition being tuberculosis, and thus aid is made in differential diagnosis such as tuberculosis from infective endocarditis. A repeatedly low tuberculo-opsonic index points towards early localized involvement. An individual can possess a low opsonic index for one organism and yet

be high for another at the same moment. In other words an injection of tubercle bacilli will raise the tuberculo-opsonic index, but would not effect the staphococci index. A low opsonic index of localized infections precede the infection, or, in other words, can be said to be the cause of said infection. It remains low because the bacteria remained locked up in a focal area instead of having free access to the blood current, for if free access were present an inoculation would follow exactly as experimental inoculations, and the phenomena of *negative phase* followed by *positive phase* and then a maintained *high tide of immunity* would result, or, in other words, an exerted immunizing influence upon the patient. Because this phenomena does not take place, localized infections do not tend to get well themselves. As an illustration, a case of lupus may begin in infancy and run through life. The opposite is true of systemic infections. In such systemic infections the high or fluctuating index is brought about by the entrance of micro-organism into the blood stream, resulting in a series of auto-inoculations with the positive and negative phases occurring just as in experimental inoculations of vaccine into a patient with the differences that the doses of vaccine are not properly adjusted and are also repeated too often and at inopportune times, such as during a negative phase. Thus the termination in such cases is a cure not long delayed, as an illustration, a specific fever running its course in one to two or three weeks when successful immunization is the result or end in death when the source of immunization has been very much over-taxed. Treatment of localized conditions by vaccine inoculation, controlled by determination of the opsonic index, can be best shown by using a common furuncle as an illustration. The lymph within the boil is poorer in staphylococci opsonins than the serum of the circulation. This is because of the stagnant circulation within the boil and though this lymph has been derived from the circulation yet it has given up its opsonins to the bacteria in the boil as it comes in contact with them during its journey from the circulation, or in other words, in going from the outside to the inside of the furuncle.

Principles of treatment of localized infections are based upon the above theory. The treatment of localized infections therefore aims at two objects; first making the lymph circulate more rapidly through the focus of infection and thereby bringing the opsonins of the blood in contact with the locked up bacteria. Secondly, to raise the opsonic content of the blood which has been shown to be low in localized infections. Rapid circulation, or the first part of the treatment can be brought about by hot poultices, hot fomentations, application of iodine, X-ray, Finsen light, radium, etc. Bags filled with hot sterilized sand are also very good. Also the well known Bier's hyperemia treatment is very effective in raising the opsonic content in localized areas, such as joints, etc.

Experiments have shown conclusively that such treatment will raise the local opsonic content. The second part of the treatment or

CHART TO SHOW ACTION OF BIER'S PASSIVE HYPERMIA TREATMENT IN RAISING OPSONIC INDEX (O.I) OF FLUID CONTAINED WITHIN LOCALIZED AREAS. THE O.I OF THE GENERAL CIRCULATION IS SHOWN AT THE SAME TIME.

	Date.	O.I. of exuding fluid before Bier's treatment.	O.I. of exuding fluid after Bier's treatment.	O.I. of general circulation.
Patient A. Tuberculous Sinus	Nov. 23.	0.3	0.7	0.8
	Dec. 4.	0.6	1.2	1.4
	Dec. 6.	0.8	1.0	1.6
	Dec. 10.	0.7	1.2	0.9
Patient B. Tuberculous Fistula	Jan. 28.	0.8	1.5	1.8
Patient C. Tuberculous Glands	Feb. 16.	0.4	1.3	1.5
	Feb. 20.	0.4	1.4	1.8
Patient D. Tuberculous Fistula	Jan. 28.	1.3	1.5	1.3
	Apr. 2.	0.6	1.0	0.8

raising the opsonic content of the patient is obtained by inoculation of vaccines, which is done under the control of the index. The proper method, therefore, is to first raise the opsonic index and then flush the infected part with the lymph rich in opsonins. Taking a tuberculous knee and giving it massage and exercise, the opsonic index will be raised, following a temporary lowering, this being the result of auto-inoculation by the bacteria escaping from the joint into the circulation. In treating systemic infections an effort must be made to prevent spontaneous auto-inoculation which will wear the patient down without immunization being produced. Therefore, it is better to try and make the systemic infection a purely local one, which can be accomplished by rest in bed and giving calcium salts and milk diet to increase the coagubility of the blood. After this condition is produced the treatment will be as in local infections, namely, properly measured inoculations of the vaccine which take the place of the improperly adjusted auto-inoculations and thereby saving the wear and tear on the patient. At this time the foci of infection must be washed with lymph rich in opsonins which can be done by proper exercise, watching the blood pressure and reducing the coaguability and viscidity of the blood by giving citric acid. The results of the above described methods of treatment, though as yet limited in successfulness, point toward an unlimited field in this line of work, which I dare say will, in the comparatively near future, replace the dependence of some of the more prominent drugs used to-day. The effect of exercise on healthy individuals is to lower the index while on the affected persons it tends to raise the same. Rest for infected patients makes no marked impression upon the opsonic index one way or the other. As has been shown, the rise from exercise in the affected patients is due to auto-inoculation and is only transitory. In conclusion it might be stated that excellent results have been obtained, by injections of vaccine carried out by strict adherence to the opsonic index, upon tuberculous joints, bones, glands, and a like infection of the urinary tract. In these many cases which have been reported in modern literature other surgical and medical methods had failed to a greater or less degree. The same can be said of infections from the staphylococcus and colon bacillus. Also the outlook for the future in vaccine therapy as applied to gonorrheal lesions is by no means gloomy and perhaps the future results as to treatment of joints in this one line will leave the patient much more satisfied than is possible at the present time. It is not only important to raise the opsonic index, but to also increase the number of phagocytes by administration of nucleinic acid, etc. Here also it may be stated that it is believed there is a definite normal index to the various opsonins, and if any person, after three or four examinations, varied from the normal, he or she is infected by the specific germ. Even if one of the four examinations made be far from the normal index, it is quite conclusive that the patient is abnormal.

The following is the technic used in determining the opsonic index from the isolation of the bacteria to staining and count. The gonococcus will be taken as an illustration. First, the great obstacle to be overcome is to prevent clumping of the gonococcus, which can be accomplished by vicious shaking for a long time. In cultivating the gonococcus ascitic or hydrocele agar is the best medium. Ascitic or hydrocele fluid is collected in sterile flasks. Two per cent agar is made 1 per cent acid and put in sterilized tubes. The agar is then cooled to 45° or 50° C., and the fluid heated to the same temperature and to each tube of agar is added one-half volume of ascitic fluid. It is then gently shaken and slanted. After the slants solidify they should be kept in a warm place for twenty-four to forty-eight hours to make sure of their sterility. Before inoculating these slants it is well to raise them to the body temperature so that all substances used shall be of equal tem-

perature, and for the same reason after inoculation incubation should be quickly accomplished. The gonococcus grows well at 37.5° C.

Making the emulsion—To one tube of growth on ascitic agar is added 1-2 C. C. of a 1.5 per cent salt solution, this being used to inhibit spontaneous phagocytosis. The growth is dislodged with a platinum wire and suspension withdrawn into a capillary pipet. The pipet is then sealed and centrifuged for one and one-half to two minutes. The supernatant fluid is then withdrawn. One part of this suspension and two parts of 1.5 per cent sodium chloride solution are placed in a pipet and churned for five minutes. This is then tested to ascertain whether it is suitable strength.

An average of one or two cocci to a leukocyte is the most desirable, and this average generally results from perfect technic in the above method. There is likely to be clumping with a higher average. The emulsion should always be carefully mixed by churning before using. In accomplishing the previous method great care must be taken that all drops are of equal size and that all emulsions are made from the same day's growth, etc.

Staining.—The following is the simplest and most accurate: fix for one minute in a saturated solution of bichloride of mercury and then wash one and a half to two minutes in alkaline methylene blue wash and blot between filter paper.

Counting Slides.—In counting, to get the normal opsonic index, taking for an example the gonococcus, two or three normal individuals are used and the average taken. Any leukocyte containing over ten gonococci is omitted. Make sure that the cocci is within the leukocyte. Similar fields must be selected for counting and the same person of course must count both normal and pathological.

Preparation of Vaccine.—One tube of ascitic bouillon (one-half bouillon and one-half ascitic fluid) is inoculated with gonococci and put in oven for forty-eight hours. From this growth one-half dozen large test tubes (one by eight inches) of ascitic agar are inoculated by pouring about ½ CC. into each tube and allowing the ascitic bouillon to flow over the surface. Put in oven for twenty-four to thirty-six hours and then remove in normal salt. This suspension is put in a new test tube and shaken for one hour to break up clumps. A small portion is then removed to standardize, the tube sealed and placed in water at 58° C. for one hour. The average dose is ten million gonococci in adults, four to eight million in children, twenty million is the maximum dose that has been used. Sometimes a local reaction results from the injection, but no general reaction has been noted. The average gonococco-opsonic index in normal subjects ranges from .8 to 1.2. The variations from this are so slight that it is quite probable that a normal gonococco-opsonic index is always present. From the results of research it can also be quite definitely stated that there also exists a pathological gonococco-opsonic index. The chronic gonorrhea cases tend to run a lower index than that found in acute cases. In most of these cases the phagocytic index runs parallel with the opsonic index. After injections the phagocytic and opsonic indices reach their highest points on the same day. The average opsonic index is generally lower than the average phagocytic index and the latter index tends to fall earlier than the former. From conclusions drawn by perseverance in the laboratory there seems to be a strong suggestion that there is a normal and pathological index to all forms of bacteria. In administration of vaccine the opsonic index is the real and only guide. Each patient is not a law by himself as to the average number of days between injections, the average highest opsonic index following injections nor as to the average opsonic index before each injection. As has been shown by numerous reports from those doing research in this line the average number of days between injections is 7.2. The highest opsonic index comes on the 3.6

day. Of course at this early date no standard has been made for complete reliability, but for work to date the former figures are practically a good standard. It is always possible to keep the index at or above normal if frequent examinations are made, so that as soon as the average has dropped to 1.0 another injection is given. This, however, is not the only guide for each patient in a way must be considered separately as to the degree of reaction, that is to say, what the maximum index was, how soon after the injection did it appear, and also whether there was a sudden or gradual drop to normal or below. These last must also be considered in determining the dosage and time of giving the vaccine. Between each injection two examinations should be made, the first to learn how high the maximum index was, and the second to know when the index drops to normal 1.0. Therefore daily examinations are unnecessary. However, an individuality must be shown to the extent that some cases rise to the maximum index more quickly than others, while some persist in a low maximum and small range all the way through, some having a stair case chart while others are more peaked. The index is surely a great aid to diagnosis even considering the fact that there are now and then cases when clinical and opsonic index diagnosis do not agree. One of the better illustrations of the value of the index in different diagnosis is that if a patient being affected with tuberculosis, and whether this affection is caused by the bovine or human tubercle bacilli. The human index will be normal and vice versa. However, an injection of human tuberculo-vaccine will also cause a reaction in a patient afflicted with bovine variety, but not to the degree that the bovine tuberculo-vaccine would. The opposite of this is also true and the conclusions would be that vaccine of closely related micro-organisms can cause formation of opsonins to the varieties of that class but not to the same extent that the exact one would be. In all this work the most supreme laboratory technic is imperative. In mixed infections the phagocytic power must be determined for each organism separately and each one treated as a single infection. This must be done because an injection from one organism will not affect the opsonins for another. The importance of isolating each organism and using a separate vaccine for each one in mixed infections cannot be too strongly emphasized. The reason for such an emphasis is that if a mixed vaccine were made say of the staphylococcus and streptococcus when the same had been thoroughly shaken as per technic, how could they be distinguished one from the other. The colon bacilli vaccine having a very small dosage, larger ones sometimes proving fatal, while many of the other vaccines are given in much larger does, you can readily see when a multiple vaccine might prove fatal and then again where a renewed injection of one kind of vaccine might be indicated by the drop in index, yet another would contraindicate an injection at that time. In closing it may be said that at the present time the laboratory results have been nothing less than marvelous, and when the same corresponding clinical verdicts can be assured by many years of trial, this form of treatment, yet in its infancy may be accepted with undoubted staunchness, but for the present it remains for the majority to keep abreast with all progressive or retrograde steps in both laboratory findings and corresponding clinical backing. All such work we must surely accept in a most conservative manner, yet giving credit just when and where it is due.

967 Elm Street.

CHOLELITHIASIS COMPLICATING TYPHOID FEVER OPERATION DURING THE FIRST WEEK RECOVERY

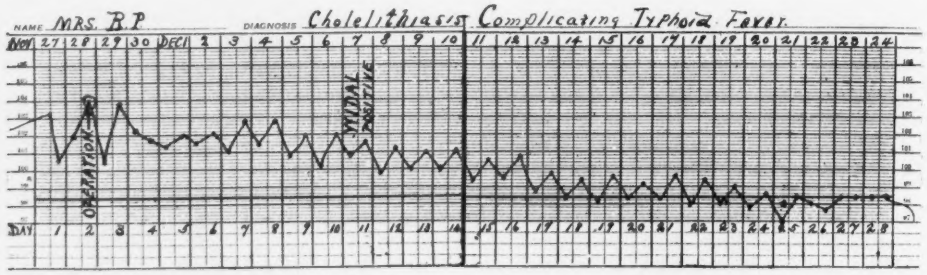
By J. M. MASON, M.D., Birmingham, Ala.,
Gynecologist to The Hillman and St. Vincent's Hospitals.

In September, 1908, I reported in *Surgery, Gynecology and Obstetrics,* a case of acute typhoidal cholecystitis operated on during the second week of the fever. Since then I have operated upon a case of cholelithiasis complicating typhoid fever in which the illness was ushered in by the gall-stone attack. The history is here presented.

Mrs. B. P., white, female, aged 28, called me to see her on November 24, 1909. I found her complaining of malaise, headache, slight nausea and loss of appetite extending back over a period of about two weeks.

heart and lungs. On November 27 I was again called and found her suffering severe pain in the region of the gall-bladder, with temperature 103.2, pulse 100, and with constant nausea and frequent vomiting.

She insisted that the pain was different from any that she had experienced with her appendiceal attacks, and I soon concluded that the trouble was with the gall-bladder. Her sclerotics were becoming jaundiced. A leucocyte count showed only 8200, and this at once aroused suspicion as to a probable typhoid infection, my experience being that so sharp a



There was a history of pain over the appendiceal region at irregular intervals for several years, and a diagnosis of chronic appendicitis had been made by her former physician in Ohio. She had occasionally experienced some sensitiveness over the gall-bladder region, but none was present at this examination. Her temperature and pulse at this time, 10 a. m., were not elevated, and she was not jaundiced. Blood examination showed 8,000 leucocytes. There were no malarial parasites.

The urine was negative, as were also the

rise of temperature, due either to inflammation of the appendix or gall-bladder, especially in the early stages, always gives a decided rise in the leucocyte count, whereas typhoid is characterized by a normal or sub-normal white count.

Blood was secured for Widal examination, but proved negative. During the night the patient vomited repeatedly in spite of treatment, and was worse by morning. Further Widal and malarial examinations were made with negative result, and leucocyte count

*Read before the Mississippi Valley Medical Association, October 12, 1909.

showed 7600. Jaundice at this time was apparent on the skin and the urine gave a reaction for bile.

Consultation was arranged with Drs. Cabot Lull and J. S. McLester, and at our examination a few suspicious spots were found on the abdomen.

We could not be sure that they were rose spots, as it did not appear to us that she was in so late a stage of typhoid. However, as we had had only one opportunity for observing the patient before the onset of these severe symptoms, we felt that we could not rule out an earlier typhoid infection, and the presence of these spots influenced us in our diagnosis.

We made a diagnosis of infection of the gall-bladder, probably complicated by typhoid fever, and secured permission to operate at once. This was done at 6 p. m., November 28, at which time the temperature was 104.

The gall-bladder was exposed through the Bevan incision and a stone was felt free in its cavity. The appendix was brought into the wound and found to be free from adhesions, but distended with fluid. It was removed, and was found to present a condition of catarrhal inflammation and to contain 15 or 20 drops of blood. The gall-bladder was then opened, the stone was removed and the bladder drained.

The patient reacted without shock, ran a typical typhoid course, and made an uninterrupted recovery. A positive Widal reaction was secured on December 7. A motile bacillus was cutivated from the contents of the gall-bladder, but it has not been identified as a typhoid bacillus.

This is, perhaps, one of the cases in which the previous presence of a gall-stone was the determining influence in directing the early symptoms of typhoid infection to the gall-bladder.

Since the report of my former operation, quite a number of others have been added to the literature.

Quenu, in Revue de Chir., Paris, June, 1908, gives the statistics in 44 cases of cholecystitis, cholelithiasis and other pathological conditions of the bile passages operated on during typhoid fever and convalesence therefrom. Thirty of the cases in his series were operated on during the illness and fourteen during convalescence.

He has tabulated the results as follows:

Operations during the attack and during convalescence	44
Recoveries	28
Deaths	16
Mortality, 36.3 per cent.	
Operations during the attack	30
Complete	22
Incomplete	8
Deaths	12
Recoveries	18
Mortality, 40 per cent.	
Completed operations	22
Deaths	5
Recoveries	17
Mortality, 22.2 per cent.	
Incomplete operations	8
Deaths	7
Recoveries	1
Mortality, 87.5 per cent.	
Of the complete operations there were:	
Cholecystectomies	17
Deaths	4
Mortality, 23.5 per cent.	
Cholecystectomeis	5
Deaths	1
Mortality, 20 per cent.	
Operations during convalescence	14
Deaths	4
Recoveries	10
Mortality, 28.6 per cent.	

In this series there are 10 perforative cases and stones were present in 13.

This is the largest series of cases so far reported, and while still too small to be of absolute value in determining the mortality, there is decided improvement over former reports.

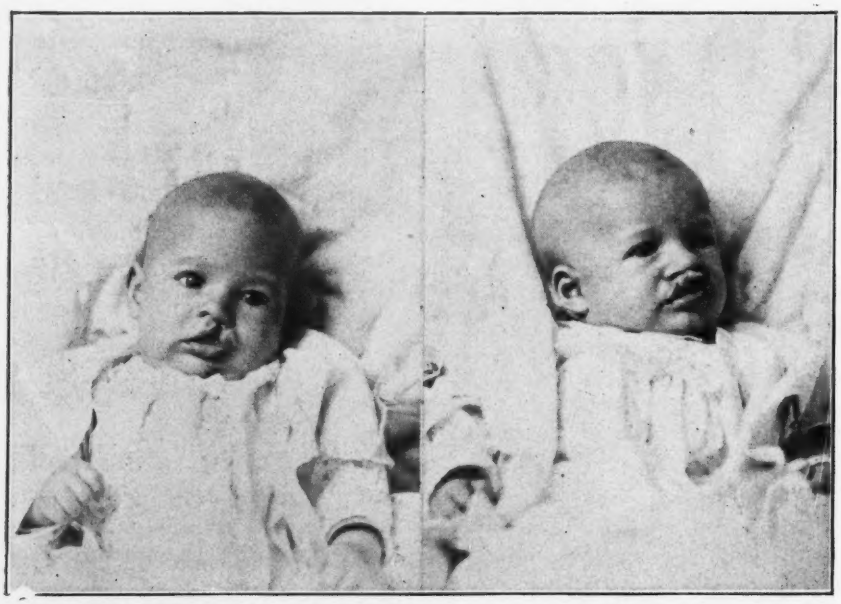
In Ashurst's series, reported in the *American Journal of the Medical Sciences*, April, 1908, there were 21 operations on the gall-

bladder during the fever with 13 deaths, a mortality of 61.9 per cent.

Since from 25 to 40 per cent of cases of typoidal infection of the gall-bladder, according to the statistics of Thomas and Keen respectively, go on to perforation if let alone, earlier operation in typhoidal cholecystitis will reduce the number of gall-bladder perforations and further improvement in mortality will follow.

HARE-LIP TWINS

By CHARLES H. CARGILE, Bentonville, Ark.



After Operation.

Failing to find a record of "hare lip twins" I report the cases of two male twins, children of Mr. and Mrs. G. W. Andrews, on whom I operated the ninth and thirteenth of March, 1907, when about three months old.

As shown by the illustrations, the deformities were not alike, one being single hare lip with only slight deformity of the dental arch, while in the other though the palate was perfect there was double fissure of both lip and arch with anterior propection of the inter-maxillary bone.

EDITORIAL

THE HOOK WORM DISEASE IN THE SOUTH.

From reports of investigations made by Dr. Stiles, of the Marine Hospital Service, Hook Worm disease is very widely distributed throughout the South among the tenant classes, especially in the sand regions of Alabama, Georgia, North and South Carolina. There can be no doubt that this disease was brought to this country by the negroes imported from Africa who, while being capable of distributing the disease and infecting large areas, do not suffer materially from its effects themselves.

It is but history repeating itself when one finds again that a lower race cannot live in the midst of a higher class without materially spreading trouble in the forms both of social problems and diseased conditions. While this disease has existed for many years in this country, recent studies have demonstrated its alarming prevalence, especially among the farming classes in the localities mentioned. The worm is incapable of propagation within the intestinal tract, but, being passed from the bowels in the form of ovums, deposited in fruitful soil such as the bad sanitation of the privies and water closets of this section of the South are known to afford, they develop in enormous numbers, infecting the white classes by entering through the skin of the soles of the feet, producing the familiar disease known as Ground Itch or dew poison, thence entering the circulation and permeating the system. They finally enter the alimentary tract and there produce the constitutional effects which are so well known throughout this section. The blood becomes impoverished with a very low haemoglobin per cent, thereby materially stunting the growth and development of the child, both mentally and physically. Indeed, adults 20 to 25 years of age, who are thus infected, look to be only 10 or 12, and in their mental lethargy are incapable of receiving even the fundamentals of an education, making, according to Dr. Stiles, a condition in which thousands of dollars are expended yearly by the Southern States in a useless effort to educate them. Not only this, but in their weakened condition they are incapable of hard labor and become practically drones in the great commercial world. It is surprising how rapidly this condition improves when surrounded by better hygiene and by the administration of the specific remedy thymol, which, in properly graded doses, seems to completely eradicate the disease. If these cases could be given this remedy early in the morning, followed by a brisk purge of either saline or castor oil at night, the whole mental and physical being would undergo a wonderful change for the better, and this disease would be eradicated very rapidly, provided a more intelligent sanitation was forced upon these ignorant people. Indeed, this is a question of such importance that it would seem justifiable that State legislation should be called in to pass laws demanding better privies by which these infectious discharges would be passed into receptacles containing crude carbolic acid, thus at once improving the general sanitation and preventing the spread of the disease. To be successful it is absolutely necessary that laws be passed and enforced, because of the ignorance of this class of tenant whites and the absolute indifference of the negro population throughout the South in all matters pertaining to public health. Dr. Stiles very correctly states and shows conclusively by years of study and observation throughout this territory that the cotton mills, condemned so widely because of child labor, not only by the North, who do not understand the conditions of the South, but by those of us who have heretofore considered the ill-health and general anaemia of this class as being due directly to the con-

finement and inhalation of the lint of the cotton mills, are truly the benefactors of these people, and that this disease, while responsible for the maladies heretofore ascribed to the mills, lessens materially when brought under the direct efforts at hygiene and sanitation. The laborers of these mills marvelously improve over those who remain on the farms as tenants amidst surroundings of filth never seen in or about cotton factory districts. In the light of these facts, given by a scientific and unprejudiced observer coming from New England, it would seem that we should go very slow when we condemn the cotton mill of the South and its child labor, when, to use his words, they are the best friends the poor tenant class in the South have. It is to be hoped that with a large negro population who are a menace to the health and prosperity of our people, the legislatures of the various Southern States will be brought to appreciate the dangers surrounding us and pass strict laws demanding their enforcement, that the white population of the South may be protected in a measure from all infections such as tuberculosis, typhoid fever, hook worm disease, etc., which are distributed and kept alive by the ignorance, superstition and indifference of our large negro population. Believing that we have the garden spot of the world south of Mason and Dixon's line, possessing every requisite for the health, happiness and prosperity of mankind, it behooves every good citizen to grapple with this proposition of public health and the unfavorable surroundings produced by local conditions, thereby controlling and eradicating them from our midst, and protecting our own people from these scourges which have been thrust upon us and kept with us by an inferior race.

THE MISSISSIPPI VALLEY MEDICAL ASSOCIATION.

The recent meeting of this large, independent medical society has just closed its thirty-fifth annual session in the city of St. Louis. A most delightful and instructive meeting, both socially and scientifically, was the expression heard on all sides, being largely attended by doctors from all over the Mississippi Valley, the far East and the Pacific slope being represented. The program contained an unusual number of papers of high class read in both the medical and surgical sections. The symposium on Exopthalmic Goitre alone was worth going miles to hear, being participated in by experts in its various phases from all parts of the country. Added to this was Dr. Stiles' paper on Hook Worm disease, illustrated by lantern slides, together with a number of papers on Pellagra by a government expert, Dr. Lavender, and Dr. Watson, of Columbia, S. C., who presented typical cases of the disease to the society, thus making a combination of scientific papers of the greatest importance to the profession. Added to this were the general addresses on medicine and surgery by Drs. Bonney, of Denver, and Deaver, of Philadelphia, both of which were classics and were received by the association with the highest appreciation for the great work which each paper showed the author had done in preparing them for this occasion.

The society also endorsed unequivocally Dr. Wiley, the government chemist, in his fight against food adulteration, and passed a resolution condemning, especially, the use of boracic acid and benzoate of soda as preservatives.

From the above it will be seen that the meeting was an unusually large and interesting one, and its entire work was on a high scientific and ethical plane. It is to be hoped that the next meeting in Detroit may continue along the same lines of scientific work and interest which has characterized the proceedings of this society since its birth.

NOTICE

Conferences will be held in Columbia, S. C., about the 3d of November for the study of pellagra, which has recently been reported in large numbers and scattered over a wide area of territory, especially throughout the South. While this disease has been found in many of the Northern States, especially in the form of pellagrous insanity, yet it seems to be more prevalent in the South among the cornbread eaters than elsewhere. All authorities are practically a unit on fermented corn being the actual cause, yet conditions simulating an infectious disease have prevailed in so many localities that it has become a question of great importance, both in the protection of the health of our people as well as the corn crop of the country.

It is to be hoped that this meeting will be well attended by men from every section of the country, and especially by representative men from the Southern States, where this disease has gained such a foothold.

ABSTRACTS OF CURRENT LITERATURE

PEDIATRICS.

INFANT FEEDING.

The science of infant feeding, says H. G. Chapin, New York (*Journal A. M. A.*, Sept. 18), consists in knowing why certain things should be done or should not be done and the effects of different procedures. The art of infant feeding comprises the methods employed. Most of the literature is related to the art and many diverse methods have been proposed. The infant is an animal and subject to the general laws of animal nutrition and, like other young mammals, is as regards its digestion, in an embryonic state for some time after its birth. The food supplied by the mother has the property of changing its physical form when it comes in contact with the gastric secretions. It assumes a more or less solid form in the stomach and the character of this solid varies as the stomachs of the different species vary, the milk of rapidly growing animals containiing more protein than that of animals of slower growth. The adaptation of milks to the infant stomach must be done according to biologic llaws which calls for a knowledge of the structure and functions of the digestive tract together with the peculiarities of the milk furnished. A chemical analysis of millk will show its ingredients and to a certain extent their potential food values. Faarther than this, chemistry cannot go. While the fats and carbohydrates are a good deal alike in the different milks, proteins are essentially different, and we must study the reactions of the proteins to the digestive secretions and then examine these eractions in relation to the growth and devlopment of the digestive tract 'in other words, investigate the question biologically before we can understand the problem. A certain portion of the proteins of all milks coagulates on coming in contact with rennin or rennin and acid, but the manner and extent of this coagulation is in direct relation to the proper evolution of the animal. While there are many grade sof coagulability in the milks of different an mals, for practical purposes we may distinguish three grades and consider their significance. In the ruminant herbivora, such as the cow and goat, the protein coagulates in solid tough masses that caannot easily leave the stomach where digestion largely occurs. In the non-ruminant herbivora, such as the horse and the ass, the protein coagulates in gelatinous masses that can easily leave the stomach and digestion is largely intestinal. In human milk the curd is throw down in flocculent masses midway between the two just described and the digestion is largely carried on in the intestines. Biologic science thus shows that the protein much curd in a specific way in each species of animal, it being the least interchanbeable of the components of milk. We must also remember that the protein has a developmental as well as a nutritive function to perform and we must not, while putting all food in a soluble form for quick absorption neglect to give proper wor kfor the secretions and musculature of the digestive organs. Chapin gives illlustrations showing how we should adapt milk for artificial feeding. We should allow for some of the protein to be throw down in more or less solid form to develop the motility of the digestive tract. If there is evidence of weakness there already by the appearance of curds in the stools, a substance like citrate of sodium added to the milk may be scientifically indicated for a time, though as a routine measure for normal infants it would be unscientific. Antacids are also contraindicated as routine measures, as there is little acid secreted in the infant's stomach, though they might be indicated to correct abnormal conditions of acidity. These illustrations show, that if we understand the science of infant feeding, the methods to be

used under different conditions will be self-evident, which will never be the case as long as chemical data alone are taken as a guide. The point ever to be kept in mind is "what is the effect of a proposed method and does it apply correct scientific principles." Many of the methods which have been proposed are good for individual cases and may be scientific under certain conditions and methods that are scientific under ordinary conditions may be unscientific under abnormal ones.

IMMATURE ATROPHIC INFANTS.

A. B. Spalding, San Francisco (*Journal A. M. A.*, September 25), describes the method of treatment suitable for immature and atrophic infants. He says that too little attention is given to pregnancy cases before term and that much could be done at times to improve the chances of the child during the long period of intrauterine life. In judging immaturity of the new-born infant, weight is of more importance than length of pregnancy, and an infant weighing less than four and a half pounds at birth may be regarded as immature. An atrophic infant, though normal at birth, tends gradually toward the type of the immature. The thickness of the intestinal wall is diminished, and there is evidence that certain needed glandular structures are deficient in function. It seems probable from recent investigations that there are, in all vertebrates, a number of so-called hormones whose function it is to stimulate or activate the various digestive ferments. They are undeveloped at birth and are functionally inactive in atrophic infants. Spalding is inclined to think that the failure of development is largely due to food intoxication caused by improper feeding —particularly the too early resort to artificial feeding or to too high percentage of butter fat. While a great deal of good has been accomplished by the percentage method, he thinks that it has practically caused an overfeeding of babies, and, while it is of greater value to feed babies according to the caloric value of food, he thinks neither system gives us a perfect method. He describes his own method of bottle feeding which has been successful in cases of delicate infants. Each immature or atrophic infant is fed according to its power of digestion as expressed clinically and for the first few days little attention is paid to the percentages or the caloric value of the food. Body warmth must be kept up and the bowels kept clear, usually by calomel. The immature babies are started with sugar solution (5 per cent), or with salt salution (0.5 per cent), and the atrophic babies with whey in order to ascertain the amount of liquid retained. Gradually the sugar solution is replaced with whey and the whey with top milk, whole milk, or fat-free milk mixtures according to the behavior of the child. Barley water is not added until the food contains from 20 to 30 per cent of milk, unless the sugars fail to agree. The quantity of food is increased to meet the desires of the child and its ability to retain it. The relations between the weight chart, the feeding chart, and the clinical chart, are constantly studied and at intervals the percentage and caloric values of the food and the energy quotient and proteid ratio are estimated to prevent over or under feeding. He describes his feeding chart in detail. The weight chart urges always for more food, but the clinical chart holds it in check. As a rule it seems to Spalding that these infants do best on a ratio of fat to protein, not more than two to one. The fat is always reduced with the first signs of digestion. He has found it necessary sometimes to give as much as 250 calories per kilo for several weeks without signs of over feeding except when the fat calories ran high.

BREAST FEEDING.

M. Ostheimer, Philadelphia (*Journal A. M. A.*, August 14), says that it is uncommon nowadays to see any attempt made to induce the mother to nurse her child, even when the breast milk has not been examined to see whether it is abnormal or not, and asks if this is not chiefly the fault of the medical adviser.

This is the case not only three or four days after birth, but later when the child is between three and six months old, breast feeding is often stopped for no apparent cause. He quotes authorities who have advocated the persistence in breast feeding and examination of the mother's milk in behalf of the infant. He says that in his experience he has found that much can be accomplished in aiding and inducing the mother to continue nursing both at the beginning and when the infant is several months old and stopping has been considered. Since the appearance of Dr. Southworth's article in the *Journal A. M. A.* (1902, xxxix, 249), he has urged the continuance of breast feeding until the baby is at least eight or nine months old. During the last few months of pregnancy not only should the nipples receive daily attention, but the habit of drinking water should be cultivated and the woman should learn to be able to drink two or three quarts a day. Exercise in the open air, a full amount of sleep and a nap during the afternoon, correct wholesome food, and attention to the regularity of the bowels are essential. After delivery it is most important that the mother take daily several quarts of water, some with meals and a great deal between meals. Tea and coffee should be prohibited during lactation. The thin corn meal gruel recommended by Southworth is next in importance, and properly flavored it can be made a very agreeable food. If the woman likes milk she should take it, but it should not be forced on her, and cocoa prepared with milk may be substituted. Ale, beer and malt extracts are not good, but Ostheimer thinks a little imported brown stout at the mid-day meal occasionally may be useful. As before delivery, exercise, fresh air, sufficient sleep, etc., are necessary. Most medical men prefer not to allow nursing in advanced tuberculosis and there is a kind of urban nervous woman in whom all efforts are apparently wasted to improve her milk supply. Dr. Southworth's suggestion to give the child both breasts temporarily, alternating with one or two bottles a day when the mother first begins treatment, will be of value in some serious cases. He gives his experience in treating these cases of deficient milk supply and tapering off from breast feeding. While special stress is laid on feeding, the ordinary hygiene must not be neglected, the child as well as its mother receiving due attention as regards this point. Ostheimer's object in writing this paper is to reiterate the immense importance of breast feeding and to report his experience in successfully urging its continuance and overcoming difficulties, few of which are found as real as the young mother thinks them.

INFANTILE DIARRHEA.

First noticing the findings of other authorities of the *Bacillus dysentericus* as the cause of the summer diarrhea of infants, C. G. Grulee, Chicago (*Journal A. M. A.*, August 14), mentions the investigations of J. S. Welch and himself, with failure to find the above organism and their conclusion that true dysentery in infants must be relatively rare in Chicago. He says there are many reasons for believing that the *B. dysentericus* is not etiologically connected with a large percentage of the diarrheas in infants. In the first place, the cases showing this organism in the stools showed no clinical differences from those in which it was absent. In the second place, the dysentery bacilli were usually few and hard to find, and, in the third place, agglutinins were by no means constantly present, as far as could be learned, and the antidysenteric serum seemed to have no effect. The dysentery bacillus has never been cultivated from the blood of these infants nor has it ever been found outside the human body, except in the laboratory animals. He therefore regards the connection of the dysentery bacillus with the summer diarrhea still, at least, an open question, with the burden of proof on those who assert its etiologic relationship. Since the infectious nature of the disorder has not been proved, we must seek elsewhere for its causes. Within the past year Finkelstein has

described a disorder of nutrition which he calls metabolic intoxication. The symptoms are the same as those of summer diarrhea as we encounter it. He has proved that this disorder is caused primarily by the inability of the organisms to properly assimilate sugar, a condition to which too much fat in the food predisposes. Czerny and Keller, while agreeing with Finkelstein to a certain extent, suggest that we may have a toxicosis due to the decomposition of the food by bacteria, either before ingestion or in the gastrointestinal tract. Grulee, after discussing the condition and pathologic findings, comes to the conclusion that while infection in the intestinal wall probably occurs in some cases, it is not the usual cause of a summer diarrhea in infants, but that this infection is, as a rule, due to disturbance of metabolism or to decomposition of the food. As regards treatment, it is evident that, if this is the case, the first indication is to stop the food and put the child on a low diet. This is not all. There must still be a supply of fluid for the system, and this we accomplish by giving barley water or weak tea. It is occasionally impossible to give this by the mouth, and it is well to resort to a continuous enema or even to a subcutaneous administration of normal salt solution. After ten to forty-eight hours of the starvation treatment it is time to give the patient food, the symptoms having usually disappeared. For the past two years he has usually employed skim milk as the first food for these children. He has, as a rule, had this boiled, which kills the bacteria and seems to be more readily digested. This skim milk is given in the amount of one and a quarter to one and a half ounces to the pound weight of the child, each twenty-four hours, and diluted sufficiently to afford the proper quantity at each feeding. This is a temporary measure, and, as soon as possible, milk sugar must be added and whole milk substituted for the skim milk. The condition of the child must be the guide. The greatest trouble with this method is the tendency to constipation when the skim milk is being replaced by whole milk, and the addition of malt may be useful. The vomiting may continue and require stomach washing and bismuth in extreme cases. Reduction of temperature can be accomplished usually by the measures already suggested, but hydrotherapy is often useful. The distention which occurs only in the more protracted cases can be temporarily relieved by the introduction of a tube into the rectum, the other end of which is placed in a vessel containing hot water. We may also use colonic flushings and hot external applications to the abdomen. Collapse can best be met by mustard packs followed by saline infusion and continuous saline enema. Grulee does not favor the use of calomel in these cases, and he believes it has been much abused. As for intestinal antiseptics generally, he sees no indications for them in these cases.

FOOD INTOXICATIONS IN CHILDREN.

J. Ruhrah, Baltimore (*Journal A. M. A.*, July 10), describes the dietetic disorders in children which constitute a considerable proportion of the cases which we are called on to treat. Leaving out the chronic gastric and intestinal disturbances, there are a large number that are due to over-feeding. These may be caused by too much food of all kinds and too little exercise, or by too much fat, protein, or carbohydrate, or too much of any combination of these. There are also individual idiosyncracies of children to any one of these, and it is well to remember also that disease of some organ may in a reflex way upset diagestion or metabolism. We cannot make a symptom-complex of each of these conditions, though it is to be hoped that it may be possible in the future. The most suggestive thing is a train of symptoms occurring periodically, no matter in what combination. The next step in diagnosis is by careful physical examination, to exclude any disease of any organ and then to study the child's habits as to food. Sometimes the fault is easily found. In other cases it requires careful in-

vestigation and sometimes trial diets. The following points are of use: Taking too much food of all kinds usually causes what are ordinarily known as bilious attacks, with recurring fever, coated tongue, vomiting or diarrhea, and the liver may be enlarged and tender. A brisk purge and a limited diet is usually all that is needed. Too much protein causes, as a rule, much the same symptoms, sometimes one and sometimes another of the above symptoms being the most prominent. There may be acute indigestion or simply furred tongue and foul breath. Cases due to too much fat are characterized by attacks when the child is not well and has a pale muddy skin and large dark circles under the eyes; a coated tongue and exceedingly fetid breath are one of the most striking features. There may be gastric disturbance and vomiting and often diarrhea with undigested fat in the stools. The carbohydrate cases are the most numerous of all, owing to the indulgence of children in sweets. Many children have a very low capacity for utilizing sugar. The recurrence periodicity is, as in the other cases, most characteristic. Perhaps the most common form of attack is recurrent vomiting, though this occurs also in protein disturbances. In some cases the attack consists merely of fever and sick headache, while in others there are attacks of asthma following indiscretions in diet. The most difficult cases are those in which there is a combination, such as an inability to utilize normal quantities of protein and carbohydrate, making it difficult to arrange the diet satisfactorily. If the cooperation of the family can be secured, after determining the food factor at fault, the results are remarkable. An effort should be made to determine just what quantity of the disturbing factor can be borne and then keep the child on a diet well within the limits of its assimilation. In addition the bowels must be kept regular, and it is well to use an active purge at least once a week. Outdoor life and plenty of exercise are exceedingly important. A number of illustrative cases are reported.

ANEMIA IN INFANCY.

J. L. Morse, Boston (*Journal A. M. A.*, July 10), says that the percentage of hemoglobin in infancy is below 55 at birth and not rising above 70 during the period properly so-called of infancy. The number of red corpuscles varies between 5,500,000 and 6,000,000. This low hemoglobin precentage is presumably due to an insufficient supply of iron in its food and the lack of sufficient reserve of iron in the liver at birth. It is probable that true chlorosis never occurs in infants as a disease, but it is a fact that the chlorotic type of blood is very common at this age. Iron is therefore specially indicated, but it is difficult to get infants to take iron by the mouth, and it is very liable moreover to disturb the digestion. It is desirable therefore to give it some other way, and infants take it subcutaneously without injury. A very serviceable form for subcutaneous use is the aqueous solution of the citrate. This can be put up in pearls, each one containing a single dose, in which form it remains sterile indefinitely. It is absolutely non-irritating and never causes abscess or induration if properly given, though it is somewhat painful. A glass syringe with an asbestos packing which can be sterilized and platinum needle that will not corrode with the iron. The average dose during infancy is three-quarters of a grain every other day. He has used this treatment in a number of cases in different types of anemia and with pretty satisfactory results even in the severe cases. In the mild cases the improvement was very rapid, and his experience leads him to recommend the use of iron in this way. The results are more marked and more quickly obtained than by oral administration, and it is much less liable to disturb digestion. It is especially indicated in severe cases of secondary anemia with digestive disorder and in those of a scilerotic type.

EYE, EAR, NOSE AND THROAT.

ACCESSORY SINUS SUPPURATION.

H. W. Loeb, St. Louis (*Journal A. M. A.*, September 25), illustrates the arrangements of the accessory nasal sinuses to show how intranasal operations are practicable, when indicated. In case of the maxillary sinus, an intranasal operation generally suffices for simple uncomplicated suppuration, provided no dental complication exists. While simple puncture is often sufficient, the best results are obtained by extensive resection of the nasoantral wall owing to the better drainage and the tendency of these openings to contract or close up altogether. This naturally requires the removal of a part of the inferior turbinate and it is important to see that the opening enters the sinus. The position of election for opening the sinus is just below the attachment of the middle portion of the inferior turbinate. In the main the inferior turbinate courses along the wall horizontally, but sometimes it has a downward and backward slope. This location would then be above the lowest portion of the floor, and it would be well to carry the resection further down and back. In some acute cases, perforation through the nose will afford, in frontal sinus, sufficient drainage and cure, but ordinarily it must be admitted that nothing short of an external radical operation suffices. We cannot expect any good result in cases in which the frontal sinus extends over the orbit and is affected in this portion. Intranasal operation therefore has only a limited utility in disease of the frontal sinus. Ethmoid suppuration, when uncomplicated, practically always responds to the intranasal treatment, for the entire ethmoid labyrinth may be exenterated by operation through the nose. The most anterior cells however cannot always be easily reached, and we must always respect the cranial wall of the sinus. Drainage alone does a great deal toward affording relief, and can be secured from the lowest portion through the nose. In uncomplicated cases where the ethmoid alone is involved with the sphenoid, the nasal route is the only one to be advocated, and is relied on more and more. While drainage cannot usually be secured from the most dependent portion, it is usually followed by relief if the opening is made permanent. The likelihood of optic nerve involvement in case of sphenoid suppuration must be considered, and the slightest suspicious eye symptoms call for immediate operation. Loeb calls attention again to an observation made two years ago that in cases in which the middle turbinate has an inclination backward and downward, the floor of the sphenoid lies at a lower level than the ethmoid or at its level. This has been confirmed by the present study as shown in the illustrations. These latter, as given in the paper, are very instructive as regards the relations of the parts to the nose and to each other.

SINUS DISEASE.

C. G. Coakley, New York (*Journal A. M. A.*, September 25), insists on the importance of a thorough examination before deciding to recommend the intranasal route for disease of the accessory sinuses in all but the very acute cases complicated by cellulitis, when an immediate external operation is indicated. This examination should include the determination of the number of sinuses involved; a skiagraph of the sinuses and the nasal passages; the general condition of the patient as marked disease of the arteries, heart, lungs or kidneys render the external operation far more serious. Determine, if possible, whether the disease is acute or chronic, and if acute decide whether the history indicates a simple inflammation of a previously healthy sinus or to an exacerbation of a chronically diseased one. In the latter case it is wiser to defer an external operation until the acute symptoms have subsided. The severity of the symptoms, especially headache and its effect on the patient, should be noted. The ultimate result of the treatment must be carefully explained to the patient. Intranasal methods relieve and

may cure, but the cavities remain and may become again infected. External operations remove the disease but leave a sometimes disfiguring scar, to which patients may object. Intranasal treatment implies frequent operations at short intervals, hence many prefer the more thorough external operation. The neurasthenic patient who is prostrated each time an operation is attempted should be urgently advised to submit to the latter. Very narrow nasal chambers add greatly to the difficulty of intranasal operations and to such patients with chronic suppuration of the frontal, ethmoid and sphenoid the external operation is advised. When considering the diseased conditions of the various sinuses requiring external operation, it seems best to divide them into acute and chronic. In acute frontal, ethmoid and sphenoid involvement accompanied by marked edema of the skin of the forehead, eyelids or side of the nose, exophthalmos, orbital cellulitis, local heat, tenderness, etc., with or without a rise of temperature an external operation is imperative and should be done at once for fear of meningeal or intracranial complications. On the other hand, Coakley would not invariably advocate external operation for the relief of slight local edema and swelling without first trying to relieve the condition by intranasal treatment. Very rarely one meets with an osteomyelitis of the superior maxillary associated with acute maxillary sinusitis. Such cases should be treated by a larger opening and drainage through the gingivo-buccal fold. All other cases of acute disease of this sinus may be satisfactorily treated intranasally. The chronic suppurations of the frontal, ethmoid and sphenoid sinuses requiring external operation are: (A) Those associated with multiple polyp formation in the nose, here an external operation may be relied upon to cure. (B) Frontal sinuses of large size and extensive prolongations and one or more septa can seldom be so drained by intranasal operations as to prevent recurrence of symptoms with every succeeding attack of severe acute rhinitis. If the patient's condition admits it, Coakley therefore advises external operation in these cases. (C) Closed empyemata of the frontal sinus, as shown by the recurring attacks of superorbital pain without history of any considerable discharge and in which the skiagraph shows involvement of the frontal are best treated by an external operation. (D) In cysts of the frontal and of the ethmoid region which do not bulge into the nasal cavity the patients are fit subjects for external operation. Any attempt to evacuate the cysts through the nose is here, with the alterations of the anatomic structure, too much guess work to be called good surgery. (E) Those in whom a fistula has formed leading from the frontal or ethmoid are advised to have an external operation, the question of scar here does not affect the patients, as they are already disfigured and may be improved by the operation. Coakley's present belief is that very few cases of chronic suppuration of the antrum need anything more than a thorough opening through the inferior meatus to effect a cure. If they do not recover promptly he searches for disease in the frontal or ethmoid cells and finds that, by curing the disease there, the antrum promptly ceases to discharge. If, however, there is a tendency to recurrence two or three times a year from attacks of acute rhinitis, he recommends a thorough opening of the antrum through the canine fossa.

PREVENTABLE DEAFNESS.

W. Sohier Bryant, New York (*Journal A. M. A.*, July 10), says that all deafness is preventable and its study involves consideration of all otology except that part dealing with equilibrium. The middle-ear changes causing deafness can be placed in two pathologic groups: 1. Ulcerative, necrotic, hypertrophic, adhesive and cicatrical processes. 2. Atrophic and sclerosing processes. The two fundamental etiologic factors of these are infection and toxic vasomotor paresis, usually of infectious origin. That is, all forms and

almost all cases of middle-ear deafness are the results of infection. This is clear enough in suppurative cases, but in cases of progressive deafness it is not so apparent, though inspection of the nasopharynx will reveal it. The prevention of infection therefore by keeping the mucous membrane normal, raising the local resistance and destroying infectious organisms by strict attention to the hygiene, is the method of cure. Local hygiene requires attention to a great variety of detail, removal of obstructions to respiration, both because they obstruct and on account of their evil reflex effects and their hindrance of proper drainage, and attention to their causal factors is one of the essentials. Infections of the nasopharynx also require special attention. especially those which are not easily apparent and do not suppurate. They usually occur on the posterior superior wall of the pharynx. Orthopedics of the facial bones and teeth are also important factors. It is needless to say that pure air and hygiene are also important. The second group of changes causing middle-ear deafness are the atrophic and sclerosing processes which are also dependent on infection as already described, or by having induced a toxic paresis of the sympathetic nervous system, as occurs in abnormal mental conditions, shock, fatigue, etc., affecting the bodily functions in neurasthenic states, menstrual and obstetric abnormal conditions, etc. The hereditary tendency to those conditions is not real but only apparent. The unstable nervous system, the weak digestion and the unbalanced metabolic functions are inherited, but the exciting cause of the diseased hearing is lacking unless some additional stress throws these weak functions out of balance and gives the initial stimulus to the condition of toxic paresis of the sympathetic system causing the middle-ear deafness. The success in preventing deafness from middle-ear disease is in proportion to the rapidity of cure of the middle-ear infection. The acute inflammatory conditions require energetic measures for drainage and preservation of the middle-ear structures, and in convalescence from acute inflammation, inflation should be practiced in order to prevent contractions and adhesions and to keep the hearing apparatus in its proper place. Syphilitic middle-ear diseases respond readily to specific treatment. Periodic examination of patients is important for success. This is true in all cases of deafness, but especially so to prevent the insidious deafness due to middle-ear atrophy and sclerosis. If the patient wait suntil he is already deaf he will bring to the specialist a very resistant sound conduction disease. The author's summary is given as follows: "Practically all deafness is due to the results of infection. Causes leading to infection are to be corrected, the soil is to be rendered non-retentive and the existing ear defects are to be treated at once. Avoidance of the infectious organisms, the maintenance of the nasopharynx in a healthy condition, the eradication of any existing infection, and the avoidance of impairment of the sympathetic nervous system through toxic action of fatigue or infection, will insure against deafness. To insure immunity from deafness, it is necessary for the individual to undergo a periodical oto-rhino-pharyngeal examination, perhaps once a year, so that any incipient middle-ear disturbance may be detected and corrected before the condition has become established."

MEDICINE.

THE CURE OF THE DRUG HABIT.

A. Lambert, New York (*Journal A. M. A.*, September 25), describes the treatment devised by a layman, Mr. Charles B. Towns, of New York City, which he has known of for five years, but of which the specific cure has been a secret until the late Opium Congress at Shanghai, at which Mr. Towns made known all the details. The specific in the treatment is the old 15 per cent tincture of belladonna and the fluid extracts of xanthoxylum (prickly ash) and the fluid extract of hyoscamus, mixed in the following propor-

tions: Tincture of belladonna 62 grams (zii), fluid extract of xanthoxylum and fluid extract of hysocyamus *aa* 31 grams (zi). While this specific is being given the patients do not suffer from the intense diarrhea which usually accompanies the withdrawal of morphin, but, on the contrary, they require energetic purpation. He prefers for this purpose the compound cathartic pills of the Pharmacopeia and the vegetable cathartic (B. P.) pill, to which he adds minute doses of capsicum, ginger and croton oil. He gives the treatment in detail. After cleaning out the bowel with 4 cathartic pills and 5 grains of blue mass and an enema, he begins with the specific, giving from 6 to 8 minims at a dose, every hour throughout the treatment, or until some sign of a belladonna intoxication is observed. Every six hours he increases the dose by 2 minims, but does not go above 16 minims at a dose. If signs of intoxication appear he stops the specific until the symptoms subside and then begins again with 8 minim doses, except in very susceptible patients, in whom 4 or 5 minims may do. He gives with the first dose of the specific from one-half to two-thirds of the usual daily dose of morphin or other drug in three doses at half-hour intervals and waits fourteen hours and then repeats the cathartic dose and again repeats it six hours later, omitting the blue mass. It is essential that the cathartic should act at this time, and it is astonishing how difficult it is sometimes to induce cathartic action. He says: "After the bowels have acted, but not before, one-third or one-half the original dose of the narcotic may be given. This will make the patient comfortable and contented and ready for the final stage. Twelve hours after the second dose of the narcotic again give 4 compound cathartic pills or from 4 to 6 B. P. pills with 5 grains of blue mass, and six hours later give an ounce or more of castor oil disguised in coffee or orange juice, but not in whisky. Just before the castor oil acts, one may have to give from 2 to 5 grains of codein phosphate, hypodermically or by mouth, to quiet the nervousness and discomfort. This is not always necessary, but it adds to the comfort of the patient and does not tie up the secretions as does opium or morphin. The castor oil at this time will produce a charactertistic stool, which shows that the entire treatment may cease. This is a liquid green stool, composed of mucus and bile. When this stool occurs, or shortly afterward, the patient often will feel suddenly relaxed and comfortable, and the previous discomfort ceases. The transition from discomfort to relaxation and contentment is often strikingly marked. After the patient has been under treatment for thirty hours, one should begin to give some cardiac stimulant, such as strychinin, 1-30 to 1-60 grain, every three hours, or digitalis or strophanthus, either one of these separately or in combination. These tend to overcome the relaxation of the vascular system, which in these patients often produces a feeling of exhaustion." The diet of these patients during treatment should be regular and of easily digested food. After they have completed the course of treatment the appetite becomes ferocious and care must be taken that they do not overeat. The treatment of alcoholics with this specific differs slightly, though the same dosage is used, though not for so long a time as arule. Most alcoholics are more sensitive to belladonna effects and the symptoms of intoxication must be looked out for and attended to. Very often the patients are taking several drugs in combination and this should be taken into consideration in the allowance of the narcotic. When cocain and morphin are taken together the initial dose of morphin should be smaller than above stated. Cocain is itself so strong a stimulant that when it is withdraw it is often necessary to give a stimulant like strychnin from the very beginning. All that is claimed for the treatment by Lambert is that it will destroy the craving for the narcotic drug or alcohol, which is often so difficult to overcome. He gives a tabulated statement of the treatment in a number of his cases.

TUBERCULOSIS NOMENCLATURE AND CLASSIFICATION.

The *Journal A. M. A.*, September 25, contains the report of the committee, consisting of Drs. H. L. Barnes, Lawrason Brown, H. S. Goodall, Estes Nichols and L. Rosenberg, in regard to the nomenclature and classification of tuberculosis, which has been approved by the American Sanatorium Association. It includes the classification adopted by the National Association for the Study and Prevention of Tuberculosis. A uniform method of examination is recommended. The patient is stripped to the waist and rales are considered absent, only when they are absent after he exhales, coughs at the end of exhalation and then takes a full, deep, fairly quick breath through the mouth. A modified form of Turban's scheme of reporting certain details about patients on admission and discharge is given in table form and recommended to be used by all sanatoria. Other tables for recording the extent of physical signs are given and recommended, which it is deemed will avoid several criticisms made on the classification of the national association. The results of sputum examinations recorded in most reports is also unsatisfactory, and a scheme of reporting is given in another table. The committee recommend that the temperature be taken by the mouth with a reliable thermometer. It should be held in the mouth for at least five minutes, and from five to ten minutes to detect the slightest rises in temperature. When the rectal temperature has been taken this fact should be noted. The committee do not all agree as regards the times for taking temperature, and what is the normal temperature is not entirely settled, but more is known about the oral than about the rectal temperature as regards this points. Patients vary somewhat in their normal rate, but it is unwise to consider any patient "arrested" or "apparently cured" when temperature for three or more days averages over 99 F. Absorption from an old focus may cause a rise when the disease is quiescent, but no one can separate such a condition from a slow advance of the disease, imperceptible by our present methods. A rise for a single day to 99.50 or even higher, if there is some cause, as coryza or tonsilitis, should be disregarded in making up the average on the charts. It would be wise to insist on a two-hour temperature record were it possible, but in any case the temperature should be taken whenever possible after rest for at least one hour, i. e., after complete relaxation mental and physical in a sitting or reclining posture. With these and other more or less important specifications the committee suggests the following classifications to be used on admission and discharge and for ultimate records.

I. ON ADMISSION.

These definitions indicate the furthest extent of the disease and the greatest severity of symptoms that a patient can present and still belong to the stage defined. All patients beyond the incipient stage fall under the moderately advanced stage unless the physical signs and symptoms exceed those of the moderately advanced stage, when they should be classified as far advanced.

Incipient—Slight or no constitutional symptoms (including particularly gastric or intestinal disturbance or rapid loss of weight). Slight or no elevation of temperature or acceleration of pulse at any time during the twenty-four hours.

Expectoration usually small in amount or absent. Tubercle bacilli may be present or absent.

Slight infiltration limited to the apex of one or both lungs or a small part of one lobe.

No tuberculous complications.

Moderately Advanced.—No marked impairment of function, either local or constitutional.

Localized consolidation moderate in extent with little or no evidence of cavity formation; or infiltration more extensive than under incipient.

No serious complications.

Far Advanced—Marked impairment of function, local and constitutional.

Marked consolidation of an entire lobe.

Or disseminated areas of beginning cavity formation.

Or serious complications.

Miliary Tuberculosis.

2. ON DISCHARGES.

Apparently Cured—All constitutional symptoms and expectoration with bacilli absent for a period of three months; the physical signs to be those of a healed lesion.

Arrested.—Absence of all constitutional symptoms; expectoration and bacilli may or may not be present; physical signs stationary or retrogressive; the foregoing conditions to have existed for at least two months. (Intended to cover all cases including those where the patient leaves contrary to advice after a stay of a few weeks, active symptoms having disappeared shortly after admission.)

Improved.—Constitutional symptoms lessened or entirely absent; physical signs improved or unchanged; cough and expectoration with bacilli usually present.

Unimproved or Progressive.—All essential symptoms and signs unabated or increased.

Died.

3. ULTIMATE RESULTS.

Cured.—All constitutional symptoms and expectoration with bacilli absent for a period of two years under ordinary conditions of life.

Well.—Patients who fulfill all the conditions required under "cured" but about whose sputum no definite information can be obtained.

Arrested.—See above.

Improved.—See above.

Progressive.—See above.

Dead.

ADENOIDS IN ADULTS.

O. Orendorff, Canon City, Colo. (*Journal A. M. A.*, September 25,), says that we are liable to fail to recognize adenoids when they occur in a well-developed, healthy adult, of age anywhere up to 50. The following is the usual history: There was catarrh in childhood with symptoms of nasal obstructions, perhaps following an attack of scarlet fever with prolonged recovery. During adolescence the symptoms gradually lessened but left symptoms of chronic catarrh of which the patient still complains. Inspection shows the usual highly arched palate with the "adenoid fringe" of its remnants, and the fauces or pharynx covered with a slimy, sticky mucus. The lingual papillæ are enlarged and there are nodules on the posterior walls—"granular pharyngitis." In his experience, Orendorff says he has never failed to find this nodular condition high up on the posterior wall, in patients over 15 years of age. The tonsils are usually sclerotic and the examining finger or mirror shows the disease to be more fibrous than in children with less of the fishworm character, but invariably more voluminous than would at first appear. These patients are generally treated for catarrh and what may be called "office suggestion" until they get tired of it. In average practice there should be four or five well defined cases met in a year. He reports and illustrates a typical case which had been overlooked by several good general physicians and by at least one specialist of reputation. When recognized, it was not relieved by the first operation and for no other reason than that it seemed too simple to call for a careful technic. The next day the voice was still muffled and the mass in the nasal pharynx was apparently as large as before. Evidently the tumor was bifurcated and the anterior portion was pushed forward into the posterior nares at the first operation. A second operation was successful. Adenoids in adults are not common, as they usually disappear before maturity, but, when they do not disappear, their character changes from those of childhood. The patients are really sufferers and there is no good in sprays or local applications or internal treatment. Results of complete operation are satisfactory and permanent.

PITUITARY TUMOR.

Archibald Church, Chicago (*Journal A. M.*

A., July 10), reviews the literature and a number of the theories of the pituitary function, and calls attention to the apparent dependence of genital growth and function on the pituitary, which, he says, furnishes us an important diagnostic set of signs and symptoms in cases unattended with acromegaly. While the symptoms in this condition may embrace all those of ordinary brain tumor, they are commonly and probably always at first, restricted to a few definite indications which, with the aid of the x-ray, makes diagnosis a certainty. Hypophysis tumor when occurring in children and not producing acromegaly, stunts the growth and especially the sexual development. The mental qualities may not be specially affected. Owing to the pressure of the tumor on the chiasm, vision is affected sooner or later and optic atrophy sooner or later is developed. In the early period the atrophy is limited to the nasal half of the disc, and this is attended, and even preceded, by loss of vision in the corresponding half of the field. Bitemporal hemianopsia is practically always due to involvement of the posterior portion of the chiasm and its detection leaves hardly any doubt of pituitary disease. The rudimentary condition of the genitals or the loss of genital function in older persons has a definite significance. To these may be added the occasional development of painful adiposity and acromegaly. By the x-ray we can clearly outline the sella turcica and detect any enlargement. The question whether a diagnosis of pituitary growth justifies attempt at surgical removal, here arises. If, as Paulesco and Cushing insist, life is impossible in dogs without the pituitary, and it had not been shown that it is not thus indispensable in man, surgery would be out of the question. Horsley has operated on a number of cases by opening the right side of the skull, the steps of the operation being similar to those for extirpation of the trifacial ganglion. Then the temporal sphenoidal lobe is lifted with spatula-like retractors and the tumor exposed. This operation presents serious difficulties. A second method has been developed by Schloffer, by way of the nose and sphenoidal sinus, and this has been done in a few cases with some success. According to Church's opinion, the nasal route is the best, as the pituitary tumor is practically extracranial, at least in many cases, the X-ray in his own cases showing it to have actually descended into the sphenoidal sinus. By this route it can be reached without the severe handling of the brain involved in the lateral operation. The fact that the nasal operation causes a deformity, a deep depression being left at the root of the nose, is an objection, but cosmetic considerations are secondary in a life-saving operation. Improved technic may also largely obviate this objection. Six cases were reported in three of which operation was performed. Two of these were performed in Europe by Horsley and Eiselsberg respectively. The other was performed in this country by McArthur by the lateral route, which was also followed by Horsley. Two of the patients have survived, at least for a while after the operation. Horsley's patient returning to this country where he died, and Eiselberg's doing well at last report. McArthur's patient rallied well after the operation, but relapsed later. To these six cases a number could be added, says Church, as coming under his observation, accompanied with acromegaly. Of course there was in such no question or difficulty in the diagnosis. It is much more important that the surgeon, the ophthalmologist, and the neurologist should recognize that a pituitary tumor may be present without association with acromegaly and can be diagnosed. Experience shows that removal of the pituitary gland is indicated since, in the first place, its removal furnishes blindness, and in the second place, seems to hold out some hope for the cure of other inconvenient symptoms. The article is illustrated.

MEDICAL EDUCATION—STATISTICS FOR 1909.

The Journal A. M. A. of August 14, 1909, the annual Educational Number, contains sta-

tistics of medical colleges, students and graduates for the year ending June 30, 1909. There were 22,145 students studying medicine last year, the lowest number in sixteen years. These are divided into 20,554 in the regular colleges, 899 in the homeopathic colleges, 413 in the eclectic, 52 in the physiomedical, and 227 in the unclassifiable colleges. There were 4,442 medical graduates last year, likewise the lowest number in sixteen years. The regular colleges had 4,090; the homeopathic 209; the eclectic, 84; the physiomedical, 15, and the unclassifiable colleges, 44. The homeopathic colleges have the lowest number since 1880 and the eclectic colleges the lowest since 1900. There are 8 less colleges than in 1908, the total now being 144, consisting of 117 regular, 14 homeopathic, 8 eclectic, 2 physiomedical, and 3 unclassifiable colleges. Women students constituted 4.2 per cent of all students, as compared with 3.7 per cent last year. Statistics show that college terms are being gradually lengthened. Tabulated statistics of college fees, including matriculation, tuition and laboratory fees, show that 73 colleges charge from $75 to $125 per year, 18 charge less than $75 per year, 36 charge between $125 and $175 per year, and 13 charge $175 or more. Some high grade colleges charge very small fees, and some low grade colleges high fees. There is no excuse, therefore, from the monetary standpoint why a student of limited finances should attend a low grade medical college. Among the colleges charging low fees are several strong state university medical colleges. Of the 144 existing colleges, 25 now require one or more years of work in a college of liberal arts for admission, and 23 others have voted to establish this requirement in 1910 or before. Six state examining boards have established the requirement for preliminary education of one or two years work in a college of liberal arts, thereby supporting the better class of colleges which have adopted that standard.

CALCIUM SALTS IN EPILEPSY

A. P. Ohlmacher, Detroit (*Journal A. M. A.*, August 14), has hitherto refrained from publishing his remarkable success following his first trial of the calcium salts in epilepsy, but now since Littlejohn (*Lancet*, May 15, 1909, p. 1382) has reported results with the same agent, he wishes to supplement it with his case. It was a child four years and four months old, with no heredity of epilepsy, in whom the disease had begun and continued from a month after his third birthday. When first seen he was having from 34 to 73 attacks a month and his mental growth had apparently stopped. The grand mal attacks as seen by Ohlmacher were very severe but never became the typical full status epilepticus. The child had frequent nosebleed following these attacks, and its nurse asserted that she could detect the odor of blood on the breath during convulsions and prior to the appearance of actual hemorrhage. At the time Ohlmacher had been working on therapeutic immunization where the problem of blood coagulability presented itself, and he had employed Wright's method of measuring the time of blood coagulation and of using calcium salts to fortify a defective coagulability. Accordingly, when his attention was called to the hemorrhages, he made a blood clotting test and finding that it was slow in clotting, he began giving calcium lactate in doses of seven to ten grains dissolved in hot water and added to the milk three times a day. This medication has been continued from this first beginning, on June 2, 1907, with no change, except occasionally reducing to one or two doses daily, to the present time. The coagulation time was soon reduced to normal and since the cessation of the epilepsy, three months after commencing the calcium lactate, the child has had occasionally nasal hemorrhages apparently related to periods of lowered coagulability. At the time he began the medicine McCallum's observation on calcium metabolism as related to parathyroid intoxication and to tetany had not been published nor had Carle's paper on calcium chlorid in therapeutics appeared. Incomplete observations on several additional

cases similarly treated tend to confirm the favorable results with the first case.

THE ORIGIN OF TABES.

J. J. Putnam, Boston (*Journal A. M. A.*, September 25), says that, while the opinion that syphilis is the usual cause of tabes is now almost universally accepted, there still remains a certain percentage of cases for which definite proof of this etology is lacking and other causes are sometimes suggested. The most prominent of these is fatigue, not that which is felt but in Edinger's sense—*i. e.*, the physiologic overstrain of certain portions of the nervous system carried to the point of damaging its power of nutritive repair. The questions therefore as to the part played by fatigue and whether or not syphilis is the sole cause are still debatable and Putnam attempts to throw some light on them by contrasting the tabetic group of cases with another group, bearing clinically and also as regards the location of lesions, a certain resemblance to tabes and which, like tabes, owe their characteristics to certain toxic influences, yet which, when intimately studied, are seen to differ widely from tabes. The cases to which he refers are those presenting anatomatically that form of degeneration of the nervous system which sometimes accompanies pernicious anemia and which occur in conditions of nutritive debility not easily classifiable in one category. The nervous symptoms characteristic of these cases resemble those of tabes, in affecting primarily and mainly the sensory or afferent functions of the nervous system and leading to well marked incoordination and paresthesias, usually with loss or sometimes increase of the knee jerks. While he has seen nearly or quite a hundred instances of this disorder, he has never yet encountered a single case of undoubted syphilis among them, thus differing widely from tabes and strengthening the evidence that syphilis in the latter disease cannot be merely a coincidence. The two disorders run true and maintain their special differences without overlapping or even approaching each other, and, in view of these considerations, he thinks that the argument for a special toxin or antitoxin as the essential cause of tabes, while not proved or asserted to be positive in every case, is nevertheless very strong and deserves special recognition as a guide to treatment.

SURGERY.

UTERINE MYOMAS.

E. E. Montgomery, Philadelphia (*Journal A. M. A.*, October 16), briefly reviews the history of the medical treatment of fibroid and the gradual acceptance of the opinion that surgical methods are better. He considers the radical operation and its disadvantages in producing absolute sterility and the possible disadvantages of the premature menopause and limits the enucleation method by the vaginal route to the growths encroaching on the uterine cavity or confined to the lower portion of the uterus and readily accessible. In any case of operation the aim should be to do as little injury to the organ as possible, consequently the number of incisions into the uterus should be limited. He reviews his own work in this line, consisting in about 37 cases of abdominal and 5 of vaginal operation. From an analysis of these and a study of the literature, he concludes that the removal of fibroid growths by operation is indicated in the following conditions: 1. When the growths are few in number and the structure of the uterus but little involved. Of course the growths may be in large number but situated so near the surface as to be removed without much mutilation, but the large number indicates a tendency to fibroid degeneration which imperils the prognosis of permanent relief. When a number of growths of considerable size are present an attempt to save the uterus may be attended with danger during subsequent convalescence and in case of future pregnancy. 2. When the growths are readily accessible through the vagina or cervical canal. A growth within the uterus, either sessile,

submucous, or intestitial, is readily attacked either by dilatation or splitting of the cervix. The enucleation compelted, the cavity may be packed with gauze, and the split cervix mended. Vaginal operation gives less constitutional disturbance than abdominal incision. 3. When the woman, whether married or unmarried, is under forty years of age and particularly when childless or with only one or two children. After the age of forty the individual suffering from such growths begins to undergo retrogressive degeneration and pregnancy is less likely to occur. 4. When the tubes and ovaries are free from complicating conditions. The existence of tubal or ovarian disease of sufficient gravity to prevent or make conception improbable, or necessitate the removal of the organs should also be an indication for the removal of the fibromyatous uterus. While it is true in the majority of cases that the tumors decrease and become quiescent after the menopause, yet the danger of necrosis and other conditions at this time is sufficient to call for complete hysterectomy. The conditions contraindicating simple enucleation are summed up by him therefore as: 1. When the woman has reached the age of forty; (2) when the uterus is spread out by the growth or growths to such a degree that the reconstruction of a functioning uterus is not feasible; (3) when the tumors are so distributed in the structure of the uterus that the necessary suturing will endanger the circulation seriously. In the last two cases the risk to the patient of trusting merely to enucleation renders it unjustifiable. Enucleation of growths may occasionally be of service in promoting the procedure of removing the uterus as he has found in certain cases, two of which he specially mentions.

ABDOMINAL SURGERY.

F. F. Simpson, Pittsburg (*Journal A. M. A.*, October 3), says that in offering surgical relief we should be prepared to give reasonable and adequate assurance that: (1) The risk is not greater than the danger to life of the condition if not interfered with; (2) if the patient recovers, there is no reason why she should not have the desired relief; (3) the conditions under which the operation is to be done are such that no other combination of circumstances offers less risk or greater security against postoperative complications; (4) in removing the one type of pathology we may be able to avoid substituting another which might cause greater discomfort; (5) no less severe kind of treatment could effect the desired result in a more satisfactory way, and (6) the benefit derived may reasonably be expected to compensate fully for the risk to life, discomfort, loss of time, inconvenience, degree and duration of disability, and the expense, and still leave a balance in the patient's credit. According as a surgeon is accurate in his estimates of these factors, will his results be satisfactory. Besides full and accurate knowledge of the general principles of pathology, anatomy, the liability to accident, and estimate of the patient's reserve strength, rigid aseptic technic, wise choice of time, and sufficient manual skill, the surgeon must have full and accurate knowledge of the nature of the disease and its trend, and as far as possible of the actual conditions. A precise and comprehensive diagnosis is especially needed in dealing with inflammatory infections of the genital tract, and a judicious adaptation of time and type of operation to the individual needs of the patient is also essential. Simpson considers the proper organization of the surgical service as a large factor in the reduction of mortality, and he gives his idea of the organization as it should be, including the surgical assistant, the skilled anesthetist, the pathologist, and the nursing force. He also lays stress on a minimum amount of anesthetic and considers that the anesthetic and its administration is a most important factor in determining operative mortality. As one thing in the aseptic precautions, is the use of sterile rubber gloves in all cases, and the operation should be so conducted as to be carried out with the greatest speed and precision that are

compatible with the other requisites. The postoperative treatment should be made as simple as possible so as to minimize the petty annoyances experienced by the patient.

THE SACROILIAC JOINT.

The question of the joint function of the sacroiliac articulation has been taken up by F. H. Albee, New York, who gives his results in the *Journal A. M. A.*, October 16. He carefully dissected fifty specimens and found in each instance a well-marked joint with synovial membrane and cavity, and strong well-formed capsule, as constant in its size and relation as any other joint in the body. Before opening, many of the joints were injected with an aqueous solution of methylene blue which colored the synovial membrane so that it could be seen to distend and retract all along the anterior-inferior aspect of the point when motion was elicited. This latter could be brought about and measured in every specimen except one in which there had been an osteoarthritis and the anterior portion of the joint had been obliterated from this cause. Under favorable circumstances, this joint will stand much abuse, as in case of a symphysiotomy, but it is liable to the affections of other joints and in case of infection the prognosis is often serious; first, because it is liable to be a metastasis from some other part, and, second, because of the danger of spontaneous drainage forward into the pelvis, owing to the thinness of the capsule anteriorly. It may also become relaxed and cause uncomfortable symptoms by too long recumbrancy, as well as trauma. His conclusions are given as follows: "1. The sacroiliac articulation has all the elements of a joint and therefore has a similar pathology. 2. It has motion and plays an important role in labor. 3. Its variation, according to individual, age or sex, is very slight. 4. Its anatomy is such that drainage into the pelvis is apt to occur, and, therefore, in the event of infection, early posterior drainage is often indicated. 5. Its affections are, undoubtedly, the cause of many obscure and unexplained backaches and persistent sciaticas. 6. The important ligaments of this joint are so placed that the sacrum and the ilium swing open, in the event of a symphysiotomy, as described above, and little permanent damage results, even if the public separation has been great enough to rupture the unimportant anterior-inferior part of the capsule. 7. The relaxation of this articulation should be guarded against by support of the lumbar spine with pillows, etc., in cases of protracted postoperative convalescence. Undoubtedly, many can recall instances of nature's warning, in the form of a convalescent's backache, which the nurse so readily relieved by merely placing a pillow under the lumbar spine."

Electro-Therapy

Many a physician has had the subject of electro-therapy broached to him. He has been told that it is valuable, but how to apply it, well, that is another story which the salesman or manufacturer is unconcerned about. Now it stands to reason that, no matter how interesting the modality may be, if we do not know how and when to apply it, it will not be of interest to the profession. Another reason why many physicians have refrained from interesting themselves in the subject is, that manufacturers have made the apparatus unnecessarily complicated. A wall plate equipped with the necessary apparatus for obtaining the galvanic and faradic current, and the cost of which does not exceed fifty dollars, including the necessary electrodes, will do as good work as the apparatus costing twice or three times as much, and be far less confusing. A Carpentier-Deprez milliammeter, with double scale for both fine and coarse reading and a Gaiffe rheostat which is wear proof, and can be regulated to a quarter milliampere, is all that is required for the administration of galvanic currents. This temperature co-efficient of the rheostat being nill the applied voltage cannot change and the readings obtained on the milliammeter will be constant.

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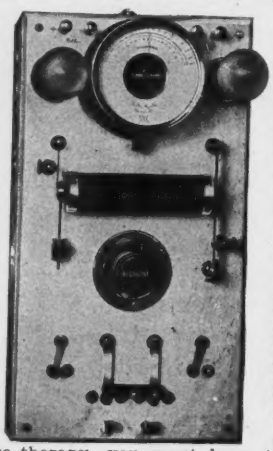

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